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Conduct of the Persian Gulf War

Final Report to Congress

Pursuant to

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and Personnel Benefits Act of 1991 (Public Law 102-25)*

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Chapters I through VIII

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For Those Who Were There

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OVERVIEW

THE CONDUCT OF THE PERSIAN GULF WAR

Saddam Hussein's invasion of Kuwait on August 2, 1990, unleashed an extraordinary series of events that culminated seven months later in the victory of American and Coalition forces over the Iraqi army and the liberation of Kuwait. Pursuant to Title V, Public Law 102-25, this report discusses the conduct of hostilities in the Persian Gulf theater of operations. It builds on the Department's Interim Report of July 1991. A proper understanding of the conduct of these military operations—the extraordinary achievements and the needed improvements—is an important and continuing task of the Department of Defense as we look to the future.

The Persian Gulf War was the first major conflict following the end of the Cold War. The victory was a triumph of Coalition strategy, of international cooperation, of technology, and of people. It reflected leadership, patience, and courage at the highest levels and in the field. Under adverse and hazardous conditions far from home, our airmen, soldiers, sailors, and marines once again played the leading role in reversing a dangerous threat to a critical region of the world and to our national interests. Their skill and sacrifice lie at the heart of this important triumph over aggression in the early post-Cold War era.

The Coalition victory was impressive militarily and important geopolitically; it will affect the American military and American security interests in the Middle East and beyond for years to come. Some of the lessons we should draw from the war are clear; others are more enigmatic. Some aspects of the war are unlikely to be repeated in future conflicts. But this experience also contains important indications of challenges to come and ways to surmount them.

America, the peaceful states of the Persian Gulf, and law-abiding nations everywhere are safer today because of the President's firm conviction that Iraq's

aggression against Kuwait should not stand. Coming together, the nations of the Coalition defied aggression, defended much of the world's supply of oil, liberated Kuwait, stripped Saddam Hussein of his offensive military capability, set back his determined pursuit of nuclear weapons, and laid a foundation for peaceful progress elsewhere in the region that is still unfolding. The efforts and sacrifices of Operations Desert Shield and Desert Storm demand that we build on the lessons we have learned and the good that we have done.

THE MILITARY VICTORY OVER IRAQ

The Coalition victory was impressive militarily. Iraq possessed the fourth largest army in the world, an army hardened in long years of combat against Iran. During that war Iraq killed hundreds of thousands of Iranian soldiers in exactly the type of defensive combat it planned to fight in Kuwait. Saddam Hussein's forces possessed high-quality artillery, frontline T-72 tanks, modern MiG-29 and Mirage F-1 aircraft, ballistic missiles, biological agents and chemical weapons, and a large and sophisticated ground-based air defense system. His combat engineers, rated among the best in the world, had months to construct their defenses. Nonetheless, Iraqi forces were routed in six weeks by U.S. and other Coalition forces with extraordinarily low Coalition losses.

The Coalition dominated every area of warfare. The seas belonged to the Coalition from the start. Naval units were first on the scene and, along with early deploying air assets, contributed much of our military presence in the early days of the defense of Saudi Arabia. Coalition naval units also enforced United Nations economic sanctions against Iraq by inspecting ships and, when necessary, diverting them away from Iraq and Kuwait. This maritime interception effort was the start of the military cooperation among the Coalition members, and helped to deprive Iraq of outside resupply and revenues. The early arrival of the Marine Corps' Maritime Prepositioning Force provided an important addition to our deterrent on the ground. The Coalition controlled the skies virtually from the beginning of the air war, freeing our ground and naval units from air attack and preventing the Iraqis from using aerial reconnaissance to detect the movements of Coalition ground forces. Tactical aircraft were on the ground and the 82nd Airborne Division's Ready Brigade had been airlifted to the theater within hours of the order to deploy. Coalition planes destroyed 41 Iraqi aircraft and helicopters in air-to-air combat without suffering a

confirmed loss to Iraqi aircraft. Coalition air power crippled Iraqi command and control and known unconventional weapons production, severely degraded the combat effectiveness of Iraqi forces, and paved the way for the final land assault that swept Iraqi forces from the field in only 100 hours. In the course of flying more than 100,000 sorties the Coalition lost only 38 fixed-wing aircraft. On the ground, Coalition armored forces traveled over 250 miles in 100 hours, one of the fastest movements of armored forces in the history of combat, to execute the now famous "left hook" that enveloped Iraq's elite, specially trained and equipped Republican Guards. Shortly after the end of the war, the U.S. Central Command (CENTCOM) estimated that Iraq lost roughly 3,800 tanks to Coalition air and ground attack; U.S. combat tank losses were fifteen.

The Coalition defeated not only Saddam Hussein's forces, but his strategy. Coalition strategy ensured that the war was fought under favorable conditions that took full advantage of Coalition strengths and Iraqi weaknesses. By contrast, Saddam's political and military strategy was soundly defeated. Despite his attempts to intimidate his neighbors, the Gulf states requested outside help; a coalition formed; the Arab "street" did not rise up on his behalf; and Israeli restraint in the face of Scud attacks undermined his plan to turn this into an Arab-Israeli war. Saddam's threats of massive casualties did not deter us; his taking of hostages did not paralyze us; his prepared defenses in Kuwait did not exact the high toll of Coalition casualties that he expected; and his army was decisively defeated. His attempts to take the offense—his use of Scuds and the attack on the Saudi town of Al-Khafji at the end of January—failed to achieve their strategic purpose. The overall result was a war in which Iraq was not only beaten, but failed to ever seize the initiative. Saddam consistently misjudged Coalition conviction and military capability.

GEOPOLITICAL CONSEQUENCES OF THE VICTORY

The victory against Iraq had several important and positive geopolitical consequences, both in the Persian Gulf and for the role the United States plays in the world. The geostrategic objectives set by the President on August 5, 1990, were achieved. Kuwait was liberated, and the security of Saudi Arabia and the Persian Gulf was enhanced. Saddam Hussein's plan to dominate the oil-rich Persian Gulf, an ambition on which he squandered his country's resources, was frustrated. The threat posed by Iraq's preponderance of military power in the region was swept

away. Although underestimated before the war, Iraqi research and production facilities for ballistic missiles and nuclear, chemical and biological weapons were significantly damaged; furthermore, victory in the war was the prerequisite for the intrusive United Nations inspection regime, which continues the work of dismantling those weapons programs. And even though Saddam Hussein remains in power, his political prestige has been crippled and his future prospects are uncertain. He is an international pariah whose hopes of leading an anti-Western coalition of Arab and Islamic peoples have been exposed as dangerous but ultimately empty boasts.

Although Saddam Hussein today has been reduced enormously in stature and power, we need to remember that the stakes in this conflict were large. Had the United States and the international community not responded to Saddam's invasion of Kuwait, the world would be much more dangerous today, much less friendly to American interests, and much more threatening to the peoples of the Middle East and beyond. The seizure of Kuwait placed significant additional financial resources and, hence, eventually military power in the hands of an aggressive and ambitious dictator. Saddam would have used Kuwait's wealth to accelerate the acquisition of nuclear, chemical and biological weapons and to expand and improve his inventory of ballistic missiles. Saddam had set a dangerous example of naked aggression that, unanswered, would ultimately have led to more aggression by him and perhaps by others as well. Having defied the United States and the United Nations, Saddam Hussein's prestige would have been high and his ability to secure new allies would have grown.

Saddam's seizure of Kuwait, left unanswered, threatened Saudi Arabia and its vast oil resources, in particular. He could have moved against Saudi Arabia; but even if he did not, the ominous presence of overwhelming force on the Kingdom's borders, coupled with the stark evidence of his ruthlessness toward his neighbors, constituted a threat to Saudi Arabia and vital U.S. interests. As Iraqi forces moved toward the border between Kuwait and Saudi Arabia, the world's largest concentration of oil reserves lay within reach. Iraqi forces could have quickly moved down the Saudi coast to seize the oil-rich Eastern Province and threaten the Gulf sheikdoms. Iraqi control of Saudi Gulf ports also would have made military operations to recapture the seized territory extremely difficult and costly. But even without physically seizing eastern Saudi Arabia, Saddam threatened to dominate most of the world's oil reserves and much of current world production, giving him the

ability to disrupt the world oil supply and hence the economies of the advanced industrial nations. He could have used this economic and political leverage, among other things, to increase his access to the high technology, materials, and tools needed for the further development of his nuclear, biological and chemical weapons and ballistic missile programs.

As the UN deadline for withdrawal approached in early January 1991, some wondered whether the use of force to free Kuwait should be postponed. The use of force will always remain for us a course of last resort, but there are times when it is necessary. By January of 1991, we had given Saddam every opportunity to withdraw from Kuwait peacefully and thereby avoid the risk of war and the cost of continued sanctions. By then he had made it clear that he considered it more important to hold on to Kuwait and had demonstrated his readiness to impose untold hardships on his people.

Further application of sanctions might have weakened the Iraqi military, especially the Iraqi Air Force; but delay would have imposed significant risks for Kuwait and the Coalition as well. Had we delayed longer there might have been little left of Kuwait to liberate. Moreover, the Coalition had reached a point of optimum strength. U.S. resolve was critical for holding together a potentially fragile coalition; our allies were reluctant only when they doubted America's commitment. Not only would it have been difficult to sustain our forces' fighting edge through a long period of stalemate, delay would have run the risk of successful Iraqi terrorist actions or a clash between Iraq and Israel or unfavorable political developments that might weaken the Coalition. Delay would also have given Iraq more time to thicken and extend the minefields and obstacles through which our ground forces had to move. It might have allowed the Iraqis to anticipate our plan and strengthen their defenses in the west. Worst of all, it would have given them more time to work on their chemical, biological, and even nuclear weapons. Since Saddam had made it clear that he would not leave Kuwait unless he was forced out, it was better to do so at a time of our choosing.

Unfortunately, Saddam Hussein's brutal treatment of his own people, which long preceded this war, has survived it. The world will be a better place when Saddam Hussein no longer misrules Iraq. However, his tyranny over Kuwait has ended. The tyranny he sought to extend over the Middle East has been turned back. The hold that he tried to secure over the world's oil supply has been

removed. We have frustrated his plans to prepare to fight a nuclear war with Iran or Saudi Arabia or Israel or others who might oppose him. We will never know the full extent of the evils this war prevented. What we have learned since the war about his nuclear weapons program demonstrates with certainty that Saddam Hussein was preparing for aggression on a still larger scale and with more terrible weapons.

This war set an extraordinary example of international cooperation at the beginning of the post-Cold War era. By weakening the forces of violence and radicalism, it has created new openings for progress in the Arab-Israeli peace process, hopes that are symbolized by the process that began with the unprecedented conference in Madrid. This is part of a broader change in the dynamics of the region. It may not be a coincidence that after this war our hostages in Lebanon were freed. The objectives for which the United Nations Security Council authorized the use of force have been achieved. Potential aggressors will think twice, and small countries will feel more secure.

Victory in the Gulf has also resulted in much greater credibility for the United States on the world scene. America demonstrated that it would act decisively to redress a great wrong and to protect its national interests in the post-Cold War world. Combined with the dissolution of the Soviet Union, the victory in the Gulf has placed the United States in a strong position of leadership and influence.

THE LESSONS OF THE WAR FOR OUR MILITARY FORCES

The war was also important for what it tells us about our armed forces, and America's future defense needs. On August 2, 1990, the very day Saddam Hussein invaded Kuwait, President Bush was in Aspen, Colorado, presenting for the first time America's new defense strategy for the 1990s and beyond, a strategy that takes into account the vast changes in Eastern Europe and the former Soviet Union and envisions significant reductions in our forces and budgets. A distinguishing feature of this new strategy—which was developed well before the Kuwait crisis—is that it focuses more on regional threats, like the Gulf conflict, and less on global conventional confrontation.

The new strategy and the Gulf war continue to be linked, as we draw on the lessons of the war to inform our decisions for the future. As we reshape America's

defenses, we need to look at Operations Desert Shield and Desert Storm for indications of what military capabilities we may need not just in the next few years, but 10, 20 or 30 years hence. We need to consider why we were successful, what worked and what did not, and what is important to protect and preserve in our military capability.

As we do so, we must remember that this war, like every other, was unique. We benefited greatly from certain of its features—such as the long interval to deploy and prepare our forces—that we cannot count on in the future. We benefited from our enemy's near-total international isolation and from our own strong Coalition. We received ample support from the nations that hosted our forces and relied on a well-developed coastal infrastructure that may not be available the next time. And we fought in a unique desert environment, challenging in many ways, but presenting advantages too. Enemy forces were fielded for the most part in terrain ideally suited to armor and air power and largely free of noncombatants.

We also benefited from the timing of the war, which occurred at a unique moment when we still retained the forces that had been built up during the Cold War. We could afford to move the Army's VII Corps from Germany to Saudi Arabia, since the Soviet threat to Western Europe had greatly diminished. Our deployments and operations benefited greatly from a world-wide system of bases that had been developed during, and largely because of, the Cold War. For example, a large percentage of the flights that airlifted cargo from the United States to the theater transited through the large and well-equipped air bases at Rhein-Main in Germany and Torrejon in Spain. Without these bases, the airlift would have been much more difficult to support. U.S. forces operating from Turkey used NATO-developed bases. In addition, bases in England and elsewhere were available to support B-52 operations that would otherwise have required greater flying distances or the establishment of support structures in the theater.

We should also remember that much of our military capability was not fully tested in Operations Desert Shield and Desert Storm. There was no submarine threat. Ships did not face significant anti-surface action. We had little fear that our forces sent from Europe or the U.S. would be attacked on their way to the region. There was no effective attack by aircraft on our troops or our port and support facilities. Though there were concerns Iraq might employ chemical weapons or biological agents, they were never used. American amphibious capabilities, though

used effectively for deception and small scale operations, were not tested on a large scale under fire. Our ground forces did not have to fight for long. Saddam Hussein's missiles were inaccurate. There was no interference to our space-based systems. As such, much of what was tested needs to be viewed in the context of this unique environment and the specific conflict.

Even more important to remember is that potential adversaries will study the lessons of this war no less diligently than will we. Future adversaries will seek to avoid Saddam Hussein's mistakes. Some potential aggressors may be deterred by the punishment Iraq's forces suffered. But others might wonder if the outcome would have been different if Iraq had acquired nuclear weapons first, or struck sooner at Saudi Arabia, or possessed a larger arsenal of more sophisticated ballistic missiles, or used chemical or biological weapons.

During the war, we learned a lot of specific lessons about systems that work and some that need work, about command relations, and about areas of warfare where we need improvement. We could have used more ships of particular types. We found we did not have enough Heavy Equipment Transporters or off-road mobility for logistics support vehicles. Sophisticated equipment was maintained only with extra care in the harsh desert environment. We were not nearly capable enough at clearing land and sea mines, especially shallow water mines. This might have imposed significant additional costs had large scale amphibious operations been required. We moved quickly to get more Global Positioning System receivers in the field and improvised to improve identification devices for our ground combat vehicles, but more navigation and identification capabilities are needed. The morale and intentions of Iraqi forces and leaders were obscure to us. Field commanders wanted more tactical reconnaissance and imagery. We had difficulty with battle damage assessment and with communications interoperability. Tactical ballistic missile defense worked, but imperfectly. Mobile missile targeting and destruction were difficult and costly; we need to do better. We were ill-prepared at the start for defense against biological warfare, even though Saddam had developed biological agents. And tragically, despite our best efforts there were here, as in any war, losses to fire from friendly forces. These and many other specific accomplishments, shortcomings and lessons are discussed in greater depth in the body of the report.

Among the many lessons we must study from this war, five general lessons noted in the Interim Report still stand out.

- Decisive Presidential leadership set clear goals, gave others confidence in America's sense of purpose, and rallied the domestic and international support necessary to reach those goals;
- A revolutionary new generation of high-technology weapons, combined with innovative and effective doctrine, gave our forces the edge;
- The high quality of our military, from its skilled commanders to the highly ready, well-trained, brave and disciplined men and women of the U.S. Armed Forces made an extraordinary victory possible;
- In a highly uncertain world, sound planning, forces in forward areas, and strategic air and sea lift are critical for developing the confidence, capabilities, international cooperation, and reach needed in times of trouble; and
- It takes a long time to build the high-quality forces and systems that gave us success.

These general lessons and related issues are discussed at length below.

Leadership

President Bush's early conviction built the domestic and international consensus that underlay the Coalition and its eventual victory. The President was resolute in his commitment both to expel the Iraqi forces from Kuwait and to use decisive military force to accomplish that objective. President Bush accepted enormous burdens in committing U.S. prestige and forces, which in turn helped the nation and the other members of the Coalition withstand the pressures of confrontation and war. Many counseled inaction. Many predicted military catastrophe or thousands of casualties. Some warned that even if we won, the Arabs would unite against us. But, having made his decision, the President never hesitated or wavered.

This crisis proved the wisdom of our Founding Fathers, who gave the office of the Presidency the authority needed to act decisively. When the time came,

Congress gave the President the support he needed to carry his policies through, but those policies could never have been put in place without his personal strength and the institutional strength of his office.

Two critical moments of Presidential leadership bear particular mention. In the first few days following the invasion, the President determined that Saddam Hussein's invasion of Kuwait would not stand. At the time, we could not be sure that King Fahd of Saudi Arabia would invite our assistance to resist Iraq's aggression. Without Saudi cooperation, our task would have been much more difficult and costly. The Saudi decision to do so rested not only on their assessment of the gravity of the situation, but also on their confidence in the President. Without that confidence, the course of history might have been different. A second critical moment came in November, 1990, when the President directed that we double our forces in the Gulf to provide an overwhelming offensive capability. He sought to ensure that if U.S. forces were to go into battle, they would possess decisive force—the U.S. would have enough military strength to be able to seize and maintain the initiative and to avoid getting bogged down in a long, inconclusive war. The President not only gave the military the tools to do the job, but he provided it with clear objectives and the support to carry out its assigned tasks. He allowed it to exercise its best judgment with respect to the detailed operational aspects of the war. These decisions enabled the military to perform to the best of its capabilities and saved American lives.

The President's personal diplomacy and his long standing and carefully-nurtured relationships with other world leaders played a major role in forming and cementing the political unity of the Coalition, which made possible the political and economic measures adopted by the United Nations and the Coalition's common military effort. Rarely has the world community come so close to speaking with a single voice in condemnation of an act of aggression.

While President Bush's leadership was the central element in the Coalition, its success depended as well on the strength and wisdom of leaders of the many countries that comprised it. Prime Minister Thatcher of Great Britain was a major voice for resisting the aggression from the very outset of the crisis. King Fahd of Saudi Arabia and the leaders of the other Gulf states—Bahrain, Qatar, the United Arab Emirates and Oman—defied Saddam Hussein in the face of imminent danger. President Mubarak of Egypt helped to rally the forces of the Arab League and

committed a large number of troops to the ground war. President Ozal of Turkey cut off the oil pipeline from Iraq and permitted Coalition forces to strike Iraq from Turkey, despite the economic cost and the risk of Iraqi military action. Prime Minister Major of Great Britain continued his predecessor's strong support for the Coalition, providing important political leadership and committing substantial military forces. President Mitterrand of France also contributed sizable forces to the Coalition. Our European allies opened their ports and airfields and yielded priorities on their railroads to speed our deployment. Countries from other regions, including Africa, East Asia, South Asia, the Pacific, North and South America, and—a sign of new times—Eastern Europe chose to make this their fight. Their commitment provided essential elements to the ultimate victory. Their unity underlay the widespread compliance with the UN-mandated sanctions regime, which sought to deprive Iraq of the revenues and imported materials it needed to pursue its military development programs and to put pressure on its leadership to withdraw from Kuwait. Once the war began, and the first Iraqi Scud missiles fell on Israeli cities, the Israeli leadership frustrated Saddam Hussein's plans to widen the war and disrupt the unity of the Coalition by making the painful, but ultimately vindicated decision to not take military action and attempt to preempt subsequent attacks.

The prospects for the Coalition were also increased by the vastly changed global context and the relationship that had been forged between President Bush and President Gorbachev of the former Soviet Union. During the Cold War, the invasion of Kuwait by Iraq—a state that had close ties to the former Soviet Union—might well have resulted in a major East-West confrontation. Instead, President Bush sought and won Soviet acceptance to deal with the problem not in the old context of an East-West showdown, but on its own terms. Without the Cold War motive of thwarting U.S. aims, the Soviet Union participated in an overwhelming United Nations Security Council majority that expressed an international consensus opposing the Iraqi aggression. No longer subordinated to East-West rivalry, the United Nations' action during the Persian Gulf crisis was arguably its greatest success to date: for the first time since the North Korean invasion of South Korea in June, 1950, the Security Council was able to authorize the use of force to repel an act of aggression.

Strong political leadership also underlay important international financial support to the war effort, including large financial contributions from Saudi Arabia,

Kuwait, the United Arab Emirates, Japan, Germany, South Korea and others to help defray U.S. incremental costs. The total amount committed to defray the costs of the U.S. involvement in the war was almost \$54 billion. This spread the financial burden of the war and helped to cushion the U.S. economy from its effects. In fact, the \$54 billion that was raised, were it a national defense budget, would be the third largest in the world.

In sum, close examination of the successful international response to the invasion of Kuwait returns repeatedly to the theme of strong leadership. President Bush's early and firm opposition to the Iraqi invasion—and the military force that stood behind it—convinced Saudi Arabia and the other Gulf states that they could withstand Iraqi threats and led others to provide not only political support at the UN but also armed forces and money to a Coalition effort. This remarkable international effort coalesced because Coalition members could take confidence from the initial U.S. commitment, whose credibility derived from the U.S. willingness and military capability to do much of the job alone, if necessary. For at the military level, U.S. leadership was critical. No other nation was in a position to assume the military responsibility shouldered by the United States in liberating Kuwait.

A Revolutionary New Generation of High-Technology Weapons

A second general lesson of the war is that high-technology systems vastly increased the effectiveness of our forces. This war demonstrated dramatically the new possibilities of what has been called the "military-technological revolution in warfare." This technological revolution encompasses many areas, including stand-off precision weaponry, sophisticated sensors, stealth for surprise and survivability, night vision capabilities and tactical ballistic missile defenses. In large part this revolution tracks the development of new technologies such as the microprocessing of information that has become familiar in our daily lives. The exploitation of these and still-emerging technologies promises to change the nature of warfare significantly, as did the earlier advent of tanks, airplanes, and aircraft carriers.

The war tested an entire generation of new weapons and systems at the forefront of this revolution. In many cases these weapons and systems were being used in large-scale combat for the first time. In other cases, where the weapons had been used previously, the war represented their first use in large numbers. For

example, precision guided munitions are not entirely new—they were used at the end of the Vietnam war in 1972 to destroy bridges in Hanoi that had withstood multiple air attacks earlier in the war—but their use in large numbers represented a new stage in the history of warfare.

Technology greatly increased our battlefield effectiveness. Battlefield combat systems, like the M1A1 tank, AV-8B jet, and the Apache helicopter, and critical subsystems, like advanced fire control, the Global Positioning System, and thermal and night vision devices, gave the ground forces unprecedented maneuverability and reach. JSTARS offered a glimpse of new possibilities for battlefield intelligence. Our forces often found, targeted and destroyed the enemy's before the enemy could return fire effectively.

The Persian Gulf War saw the first use of a U.S. weapon system (the Patriot) in a tactical ballistic missile defense role. The war was not the first in which ballistic missiles were used, and there is no reason to think that it will be the last. Ballistic missiles offered Saddam Hussein some of his few, limited successes and were the only means by which he had a plausible opportunity (via the attacks on Israel) to achieve a strategic objective. While the Patriot helped to counter Saddam Hussein's use of conventionally-armed Scud missiles, we must anticipate that in the future more advanced types of ballistic missiles, some armed with nuclear, chemical or biological warheads, will likely exist in the inventories of a number of Third World nations. More advanced forms of ballistic missile defense, as well as more effective methods of locating and attacking mobile ballistic missile launchers, will be necessary to deal with that threat.

The importance of technology in the impressive results achieved by Coalition air operations will be given special prominence as strategists assess the lessons of Desert Storm. Precision and penetrating munitions, the ability to evade or suppress air defenses, and cruise missiles made effective, round-the-clock attacks possible on even heavily defended targets with minimal aircraft losses. Drawing in large part on new capabilities, air power destroyed or suppressed much of the Iraqi air defense network, neutralized the Iraqi Air Force, crippled much of Iraq's command and control system, knocked out bridges and storage sites and, as the war developed, methodically destroyed many Iraqi tanks and much of the artillery in forward areas capable of delivering chemical munitions.

Indeed, the decisive character of our victory in the Gulf War is attributable in large measure to the extraordinary effectiveness of air power. That effectiveness apparently came as a complete surprise to Iraqi leaders. This was illustrated by Saddam Hussein's pronouncement a few weeks after he invaded Kuwait that, "The United States relies on the air force, and the air force has never been the decisive factor in the history of war." Coalition land and sea-based air power was an enormous force multiplier, helping the overall force, and holding down Coalition casualties to exceptionally low levels. Air power, including attack helicopters and other organic aircraft employed by ground units, was a major element of the capability of the ground forces to conduct so effectively a synchronized, high speed, combined arms attack. Moreover, it helped enable the Arab/Islamic and Marine Corps forces—whose assigned missions were to mount supporting attacks against major Iraqi forces in place in southeastern Kuwait—to reach Kuwait City in just three days.

Although the specific circumstances of the Coalition campaign were highly favorable to such an air offensive, the results portend advances in warfare made possible by technical advances enabling precision attacks and the rapid degradation of air defenses. That assessment acknowledges that the desert climate was well suited to precision air strikes, that the terrain exposed enemy vehicles to an unusual degree, that Saddam Hussein chose to establish a static defense, and that harsh desert conditions imposed constant logistical demands that made Iraqi forces more vulnerable to air interdiction. And, with Iraq isolated politically, the Coalition air campaign did not risk provoking intervention by a neighboring power—a consideration which has constrained the U.S. in other regional wars. Nonetheless, while we should not assume that air power will invariably be so successful with such low casualties in future wars fought under less favorable conditions, it is certain that air power will continue to offer a special advantage, one that we must keep for ourselves and deny to our opponents.

On the other hand, air power alone could not have brought the war to so sharp and decisive a conclusion. Saddam not only underestimated the importance of the Coalition air forces, but he underestimated our will and ability to employ ground and maritime forces as well. The ground offensive option ensured that the Coalition would seize the initiative. A protracted air siege alone would not have had the impact that the combination of air, maritime and ground offensives was able to

achieve. Without the credible threat of ground and amphibious attacks, the Iraqi defenders might have dispersed, dug in more deeply, concentrated in civilian areas, or otherwise adopted a strategy of outlasting the bombing from the air. For these purposes, even a much smaller Iraqi force would have sufficed. Such a strategy would have prolonged the conflict and might have strained the political cohesion of the Coalition. Given more time, Iraq might have achieved Scud attacks with chemical or other warheads capable of inflicting catastrophic casualties on Israeli or Saudi citizens or on Coalition troop concentrations. Even absent those contingencies, a failure to engage on the ground would have left Saddam Hussein able to claim that his army was still invincible. The defeat of that army on the ground destroyed his claims to leadership of the Arab world and doomed his hopes to reemerge as a near term threat.

As was recognized by senior decisionmakers from the earliest days of planning a possible offensive campaign, the combination of air, naval and ground power used together would greatly enhance the impact of each. The air campaign not only destroyed the combat effectiveness of important Iraqi units, but many that survived were deprived of tactical agility, a weakness that our own ground forces were able to exploit brilliantly. The threat of ground and amphibious attacks forced the Iraqis to concentrate before the ground attack and later to move, increasing the effect of air attacks. Similarly, while the air campaign was undoubtedly a major reason why more than 80,000 Iraqi soldiers surrendered, most of these surrendered only when advancing ground forces gave the Iraqis in forward positions the chance to escape the brutal discipline of their military commanders. The ground campaign also enabled the capture and destruction of vast quantities of Iraqi war materiel.

Evaluations of such complex operations inherently risk selective interpretation, which may miss the key point that the collective weight of air, maritime, amphibious, and ground attacks was necessary to achieve the exceptional combat superiority the Coalition forces achieved in the defeat of Iraq's large, very capable forces. In sum, while air power made a unique and significantly enlarged contribution to the decisive Coalition victory, the combined effects of the air, maritime and ground offensives—with important contributions from many supporting forces—were key.

The military technological revolution will continue to pose challenges to our forces both to keep up with competing technologies and to derive the greatest

potential from the systems we have. For example, the extensive use of precision munitions created a requirement for much more detailed intelligence than had ever existed before. It is no longer enough for intelligence to report that a certain complex of buildings housed parts of the Iraqi nuclear program; targeteers now want to know precisely which function is conducted in which building, or even in which part of the building, since they have the capability to strike with great accuracy. In addition, the high speed of movement of the ground forces creates a requirement to know about the locations and movements of friendly and opposing formations to a greater depth than would have been the case in a more slowly moving battle. Such improvements can make our forces more effective and save lives that might otherwise be tragically lost to fire from friendly forces—an area in which we still need to improve.

As we assess the impressive performance of our weaponry, we must realize that, under other circumstances, the results might have been somewhat less favorable. Conditions under which the Persian Gulf conflict was fought were ideal with respect to some of the more advanced types of weapons. Even though the weather during the war was characterized by an atypically large percentage of cloud cover for the region, the desert terrain and climate in general favored the use of airpower. The desert also allowed the U.S. armored forces to engage enemy forces at very long range before our forces could be targeted, an advantage that might have counted for less in a more mountainous or built-up environment.

In addition, future opponents may possess more advanced weapons systems and be more skilled in using them. In general, Iraqi equipment was not at the same technological level as that of the Coalition, and Iraq was even further behind when it came to the quality and training of its military personnel and their understanding of the military possibilities inherent in contemporary weaponry. A future adversary's strategy may be more adept than Saddam's. But, the U.S. must anticipate that some advanced weaponry will for a number of reasons become available to other potential aggressors. Relevant technologies continue to be developed for civilian use; the end of the Cold War is likely to bring a general relaxation in constraints on trade in high-technology items; and declining defense budgets in their own countries may lead some arms producers to pursue more vigorously foreign sales and their governments to be more willing to let them sell "top-of-the-line" equipment. Thus, much care is needed in applying the lessons of this war to a possible future

one in which the sides might be more equal in terms of technology, doctrine, and the quality of personnel.

The war showed that we must work to maintain the tremendous advantages that accrue from being a generation ahead in weapons technology. Future adversaries may have ready access to advanced technologies and systems from the world arms market. A continued and substantial research and development effort, along with renewed efforts to prevent or at least constrain the spread of advanced technologies, will be required to maintain our advantage.

The High Quality of the U.S. Armed Forces

The third general lesson is the importance of high-quality troops and commanders. Warriors win wars, and smart weapons require smart people and sound doctrine to maximize their effectiveness. The highly trained, highly motivated all-volunteer force we fielded in Operations Desert Shield and Desert Storm is the highest quality fighting force the United States has ever fielded.

Many aspects of the war—the complexity of the weapon systems used, the multinational coalition, the rapidity and intensity of the operations, the harsh physical environment in which it was fought, the unfamiliar cultural environment, the threat of chemical or biological attack—tested the training, discipline and morale of the members of the Armed Forces. They passed the test with flying colors. From the very start, men and women in the theater, supported by thousands on bases and headquarters around the world, devoted themselves with extraordinary skill and vigor to this sudden task to mount a major military operation far from the United States and in conditions vastly different from the notional theaters for which our forces had primarily trained in the Cold War. Reflecting that American “can do” spirit, the campaign included some remarkable examples where plans were improvised, work arounds were found, and new ways of operating invented and rapidly put into practice. Over 98 percent of our all-volunteer force are high school graduates. They are well trained. When the fighting began, they proved not just their skills, but their bravery and dedication. To continue to attract such people we must continue to meet their expectations for top-notch facilities, equipment and training and to provide the quality of life they and their families deserve. In taking

care of them, we protect the single most important strategic asset of our armed forces.

The units that we deployed to the Gulf contrast meaningfully with the same units a decade ago. Among our early deployments to Saudi Arabia following King Fahd's invitation were the F-15 air superiority fighters of the 1st Tactical Fighter Wing from Langley Air Force Base in Virginia. Within 53 hours of the order to move, 45 aircraft were on the ground in Saudi Arabia. Ten years ago, that same wing failed its operational readiness exam; only 27 of 72 aircraft were combat ready—the rest lacked spare parts.

The 1st Infantry Division out of Fort Riley, Kansas, did a tremendous job in the Gulf. When we called upon them to deploy last fall, they were ready to go. But, 10 years ago, they only had two-thirds of the equipment needed to equip the division, and half of that was not ready for combat.

Our forces' performance bore testimony to the high quality of the training they had received. Of particular note are the various training centers which use advanced simulation, computer techniques, and rigorous field operations to make the training as realistic as possible and to exploit the benefits of subsequent critique and review. For example, many of the soldiers who fought in Desert Storm had been to the armored warfare training at the National Training Center at Fort Irwin, California, which has been described as tougher than anything the troops ran into in Iraq. Similarly, the Air Force "Red Flag" exercise program, which employs joint and multinational air elements in a realistic and demanding training scenario, provided a forum for the rehearsal of tactics, techniques and procedures for the conduct of modern theater air warfare. The Navy's "Strike University" aided greatly in air and cruise missile operations, and the Marine Corps training at 29 Palms sharpened Marine desert war fighting skills. That is the way training is supposed to work.

The war highlighted as well the importance and capability of the reserves. The early Operation Desert Shield deployments would not have been possible without volunteers from the Reserves and National Guard. The call-up of additional reserves under the authority of Title 10, Section 673(b)—the first time that authority has ever been used—was critical to the success of our operations. Reserves served in combat, combat support and combat service support roles—and they served well. However, the use of reserves was not without some problems. For

example, the war exposed problems with including reserve combat brigades in our earliest-deploying divisions. Tested in combat, the Total Force concept remains an important element of our national defense. Nonetheless, as we reduce our active forces under the new strategy, we will need to reduce our reserve components as well.

Our success in the Gulf reflected outstanding military leadership, whether at the very top, like General Colin Powell, Chairman of the Joint Chiefs of Staff, and General Norman Schwarzkopf, Commander in Chief of the forces in U.S. Central Command; or at the Component level, like Lieutenant General Chuck Horner, who orchestrated the Coalition's massive and brilliant air campaign, or Vice Admiral Hank Mauz and Vice Admiral Stan Arthur, who led the largest deployment of naval power into combat since World War II, or Lieutenant General John Yeosock, who implemented the now-famous "left hook," or Lieutenant General Walt Boomer who led his Marines to the outskirts of Kuwait City, while continuing to divert Iraqi attention to a possible amphibious attack, or Lieutenant General Gus Pagonis who provisioned this enormous force that had deployed unexpectedly half-way around the world; or at the Corps or division commander, wing commander, or battle group commander level. The command arrangements and the skills of the military leadership were challenged by the deployment of such a large force in a relatively short period of time, the creation or substantial expansion of staffs at various levels of command and the establishment of working relationships among them, the melding of the forces of many different nations and of the different services into an integrated theater campaign, and the rapid pace of the war and the complexity of the operations. The result was a coordinated offensive operation of great speed, intensity and effectiveness.

This conflict represented the first test of the provisions of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 in a major war. The act strengthened and clarified the authority of the Chairman of the Joint Chiefs of Staff. We were fortunate in this precedent setting time when joint arrangements were tested to have a Chairman with the unique qualities of General Colin Powell. General Powell's strategic insight and exceptional leadership helped the American people through trying times and ensured our forces fought smart. He drew upon all of our capabilities to bring the necessary military might to bear. We were also fortunate to have a superb Vice Chairman, Admiral Dave Jeremiah, and an

outstanding group of Service Chiefs who provided excellent military advice on the proper employment of their forces. Working with their Service Secretaries, they fielded superbly trained and equipped forces, and saw that General Schwarzkopf got everything he required to prosecute the campaign successfully. The nation was well served by General Carl Vuono, Admiral Frank Kelso, General Merrill McPeak, and General Al Gray of the Joint Chiefs, as well as Admiral Bill Kime of the Coast Guard. To them and their associates, great credit must be given.

The act also clarified the roles of the Commanders in Chief of the Unified and Specified Commands and their relationships with the Services and the service components of their commands. Overall, the operations in the Gulf reflected an increased level of jointness among the services. Indeed, in the spirit of Goldwater-Nichols, General Schwarzkopf was well-supported by his fellow commanders. General H.T. Johnson at Transportation Command delivered the force. General Jack Galvin at European Command provided forces and support. General Donald Kutyna at Space Command watched the skies for Scuds. General Ed Burba, commanding Army forces here in the continental U.S., provided the Army ground forces and served as rear support. Admiral Chuck Larson in the Pacific and Admiral Leon Edney in the Atlantic provided Navy and Marine Forces, while General Lee Butler at SAC provided bombers, refuelers, and reconnaissance. General Carl Stiner provided crack special operations forces. It was a magnificent team effort.

General Schwarzkopf and his counterparts from diverse Coalition nations faced the task of managing the complex relationships among their forces. This task, challenging enough under the best of circumstances, was particularly difficult given the great cultural differences and political sensitivities among the Coalition partners. The problem was solved by an innovative command arrangement involving parallel international commands, one, headed by General Schwarzkopf, incorporating the forces from the Western countries, and another, under the Saudi commander, Lieutenant General Khalid bin Sultan bin Abdul-Aziz, for the forces from the Arab and Islamic ones. In historical terms, the Coalition was noteworthy not only because of the large number of nations that participated and the speed with which it was assembled, but also because the forces of all these nations were participating in a single theater campaign, within close proximity to each other on the battlefield. The close coordination and integration of these diverse units into a cohesive fighting force was achieved in large part thanks to the deftness with which General

Schwarzkopf managed the relations with the various forces of the nations of the Coalition and to his great skill as a commander.

The high quality of our forces was critical to the planning and execution of two very successful deception operations that surprised and confused the enemy. The first deception enabled the Coalition to achieve tactical surprise at the outset of the air war, even though the attack, given the passage of the United Nations deadline, was in a strategic sense totally expected and predictable. The deception required, for example, the careful planning of air operations during the Desert Shield period, to accustom the Iraqis to intense air activity of certain types, such as refueling operations, along the Saudi border. As a result, the heavy preparatory air activity over Saudi Arabia on the first night of Desert Storm does not appear to have alerted the Iraqis that the attack was imminent.

The second deception operation confused the Iraqis about the Coalition's plan for the ground offensive. Amphibious landing exercises as well as other activities that would be necessary to prepare for a landing (such as mine sweeping near potential landing areas) were conducted to convince the Iraqis that such an attack was part of the Coalition plan. At the same time, unobserved by the Iraqis who could not conduct aerial reconnaissance because of Coalition air supremacy, the VII Corps and XVIII Airborne Corps shifted hundreds of kilometers to the west from their initial concentration points south of Kuwait. Deceptive radio transmissions made it appear that the two Corps were still in their initial positions, while strict discipline restricted reconnaissance or scouting activity that might have betrayed an interest in the area west of Kuwait through which the actual attack was to be made. The success of this deception operation both pinned down several Iraqi divisions along the Kuwaiti coast and left the Iraqis completely unprepared to meet the Coalition's "left hook" as it swung around the troop concentrations in Kuwait and enveloped them.

Coalition strategy also benefited immensely from psychological operations, the success of which is evidenced primarily by the large number of Iraqi soldiers who deserted Iraqi ranks or surrendered without putting up any resistance during the ground offensive. Our efforts built on, among other factors, the disheartening effect on Iraqi troops of the unanswered and intensive Coalition aerial bombardment, the privations they suffered due to the degradation of the Iraqi logistics system, and the threat of the impending ground campaign. Radio

transmissions and leaflets exploited this demoralization by explaining to the Iraqi troops how to surrender and assuring them of humane treatment if they did. More specific messages reduced Iraqi readiness by warning troops to stay away from their equipment (which was vulnerable to attack by precision munitions) and induced desertions by warning troops that their positions were about to be attacked by B-52s.

The skill and dedication of our forces were critical elements for the Coalition's efforts to design and carry out a campaign that would, within the legitimate bounds of war, minimize the risks of combat for nearby civilians and treat enemy soldiers humanely. Coalition pilots took additional risks and planners spared legitimate military targets to minimize civilian casualties. Coalition air strikes were designed to be as precise as possible. Tens of thousands of Iraqi prisoners of war were cared for and treated with dignity and compassion. The world will not soon forget pictures of Iraqi soldiers kissing their captors' hands.

In the course of Desert Shield and Desert Storm our troops spent long hours in harsh desert conditions, in duststorms and rainstorms, in heat and cold. The war saw tense periods of uncertainty and intense moments under enemy fire. It was not easy for any American personnel, including the quarter of a million reservists whose civilian lives were disrupted, or for the families separated from their loved ones. The fact that our pilots did not experience high losses going through Iraqi air defenses and our ground forces made it through the formidable Iraqi fortifications with light casualties does not diminish the extraordinary courage required from everyone who faced these dangers. It was especially hard for American prisoners of war, our wounded, and, above all, the Americans who gave their lives for their country and the families and friends who mourn them. Throughout these trials as America—indeed, all the world—watched them on television, American men and women portrayed the best in American values. We can be proud of the dignity, humanity and skill of the American soldier, sailor, airman and marine.

Sound Planning

The fourth general lesson of the Persian Gulf conflict is the importance in a highly uncertain world of sound planning, of having forces forward that build trust and experience in cooperative efforts, and of sufficient strategic lift.

Advance planning played an important role as the Persian Gulf conflict unfolded. It was important in the days immediately following Saddam Hussein's invasion of Kuwait to have a clear concept of how we would defend Saudi Arabia and of the forces we would need. This was important not just for our decisionmakers, but for King Fahd and other foreign leaders, who needed to judge our seriousness of purpose, and for our quick action should there be a decision to deploy. Our response in the crisis was greatly aided because we had planned for such a contingency.

In the fall of 1989, the Department shifted the focus of planning efforts in Southwest Asia to countering regional threats to the Arabian peninsula. The primary such threat was Iraq. As a result, CENTCOM prepared a Concept Outline Plan for addressing the Iraqi threat in the Spring of 1990. The outline plan contained both the overall forces and strategy for a successful defense of friendly Gulf states. This plan was developed into a draft operations plan by July 1990. In conjunction with the development of the plan, General Schwarzkopf had arranged to conduct an exercise, INTERNAL LOOK 90, which began in July. This exercise tested aspects of the plan for the defense of the Arabian peninsula. When the decision was made to deploy forces in response to King Fahd's invitation, this plan was selected as the best option. It gave CENTCOM a head start.

However, while important aspects of the planning process for the contingency that actually occurred were quite well along, more detailed planning for the deployment of particular forces to the region had only just begun and was scheduled to take more than a year to complete. In the end, the actual deployments for Desert Shield and Desert Storm were accomplished in about half that time.

In the future we must continue to review and refine our planning methods to make sure that they enable us to adapt to unforeseen contingencies as quickly and as effectively as possible. General Eisenhower once remarked that while plans may not be important, planning is. The actual plans that are devised ahead of time may not fit precisely the circumstances that eventually arise, but the experience of preparing them is essential preparation for those who will have to act when the unforeseen actually occurs. If we are to take this maxim seriously, as our recent experience suggests we should, then several consequences seem to flow. Training must emphasize the speed with which these types of plans must be drawn up, as that is likely to be vital in an actual crisis. Management systems, such as those

which support deployment and logistics, must be automated with this need for flexibility in mind. Overall, planning systems must increasingly adapt rapidly to changing situations, with forces tailored to meet unexpected contingencies.

Past U.S. investment and experience in the region were particularly critical to the success of our efforts. Saudi Arabia's airports and coastal infrastructure were well developed to receive a major military deployment. U.S. pilots had frequently worked with their Saudi counterparts. Each of these factors, in turn, reflected a legacy of past defense planning and strategic cooperation. U.S. steadfastness in escorting ships during the Iran-Iraq War, despite taking casualties, added an important element of credibility to our commitments. Without this legacy of past cooperation and experience in the region, our forces would not have been as ready, and the Gulf States might never have had the confidence in us needed for them to confront Iraq.

The success of Operations Desert Shield (including the maritime interception effort) and Desert Storm required the creation of an international coalition and multinational military cooperation, not just with the nations of the Arabian peninsula, but with the United Kingdom, France, Egypt, Turkey and a host of other nations. These efforts were greatly enhanced by past military cooperation in NATO, in combined exercises, in U.S. training of members of the allied forces, and in many other ways.

A key element of our strategy was to frustrate Saddam Hussein's efforts to draw Israel into the war and thereby change the political complexion of the conflict. We devoted much attention and resources to this problem, but we could not have succeeded without a history of trust and cooperation with the Israelis.

The Persian Gulf War teaches us that our current planning should pay explicit attention to the kinds of relationships which might support future coalition efforts. Building the basis for future cooperation should be an explicit goal of many of our international programs, including training, weapons sales, combined exercises and other contacts.

Long Lead Times

The forces that performed so well in Desert Storm took a long time to develop; decades of preparation were necessary for them to have been ready for use in 1991. The cruise missiles that people watched fly down the streets of Baghdad were first developed in the mid-'70s. The F-117 stealth fighter bomber, which flew many missions against heavily defended targets without ever being struck, was built in the early '80s. Development and production of major weapons systems today remain long processes. From the time we make a decision to start a new aircraft system until the time it is first fielded in the force takes on the average roughly 13 years.

What is true of weapons systems is also true of people. A general who is capable of commanding a division in combat is the product of more than 25 years' training. The same is true for other complex tasks of military leadership. To train a senior noncommissioned officer to the high level of performance that we expect today takes 10 to 15 years.

Units and command arrangements also take time to build and perfect. The units described earlier that were not ready for combat a decade ago took years to build to their current state. It takes much longer to build a quality force than to draw it down. Just five years after winning World War II, the United States was almost pushed off the Korean peninsula by the army of a third-rate country.

In the past, the appearance of new weapons has often preceded the strategic understanding of how they could be used. As a result, the side that had a better understanding of the implications of the new weapons often had a tremendous advantage over an opponent whose weapons might have been as good and as numerous, but whose concept of how to use them was not. German success in 1940, for example, was less the result of superior hardware than superior doctrine. Thus, appropriate doctrine and accumulated training will be critically important in the years ahead. Here, too, years of study and experiment are required to get the most from our forces. Study of Desert Storm will, itself, be of great importance.

Finally, as noted earlier, the war has reminded us of how important investments in infrastructure and practice in international cooperative efforts can be to build the trust and capabilities that will be needed to put together future coalitions

and to enable them to operate successfully in future crises. It takes years of working together to build these kinds of ties.

IMPLICATIONS FOR THE FUTURE

The Persian Gulf conflict reminds us that we cannot be sure when or where the next conflict will arise. In early 1990, many said there were no threats left because of the Soviet withdrawal from Eastern Europe; very few expected that we would be at war within a year. We are constantly reminded of the unpredictability of world events. Few in early 1989 expected the dramatic developments that occurred in Eastern Europe that year. Fewer still would have predicted that within two years the Soviet Union itself would cease to exist. Looking back over the past century, enormous strategic changes often arose unexpectedly in the course of a few years or even less. This is not a lesson which we should have to keep learning anew.

Our ability to predict events 5, 10, or 15 years in the future is quite limited. But, whatever occurs, we will need high-quality forces to deter aggression or, if necessary, to defend our interests. No matter how hard we wish for a just peace, there will come a time when a future President will have to send young Americans into combat somewhere in the world.

As the Department of Defense reduces the armed forces over the next five years, two special challenges confront us, both of which were highlighted by Operation Desert Storm. The first is to retain our technological edge out into the future. The second is to be ready for the next Desert Storm-like contingency that comes along. Just as the high-technology systems we used in the Gulf war reflect conceptions and commitments of 15, 20, or 25 years ago, so the decisions we make today will decide whether our forces 10 or 15 years from now have what they need to do the job with minimum losses. We want our forces of the year 2015 to have the same high quality our forces had in Desert Storm.

To provide a high-quality force for the future, we must be smart today. We must keep up our investment in R&D, personnel and crucial systems. But we must also cut unneeded production, reduce our active and reserve forces, and close unneeded bases so we can use our resources where they are most needed. M1A1 tanks, F-16s and F-14 aircraft are excellent systems, but we have enough of them;

and some planned modernization can be safely deferred. We can better use the money saved by investing in the systems of the future. Reserve forces are valuable but, as we cut the active forces, we must cut the Reserves and National Guard units assigned the mission of supporting them. Our declining defense budgets must sustain the high level of training our remaining forces need. And, as we cut forces, we should cut base structure. Common sense dictates that a smaller force requires fewer bases.

To reach these goals, the Department has developed a new acquisition strategy, tailored to the post-Cold War world, that will enable us to get the most from our research and acquisition efforts at the lowest cost. We have proposed major cuts in new programs, shut down production lines, and sought significant cuts in active and reserve forces and domestic and overseas base structure. With the help of Congress and the American people, we can have a strong defense at greatly reduced cost.

As we reshape America's military and reduce its size, we must be careful that we do so in accordance with our new defense strategy and with a plan that will preserve the integrity of the military capability we have so carefully built. If we try to reduce the force too quickly, we can break it. If we fail to fund the training and high quality we have come to expect, we will end up with an organization that may still outwardly look like a military, but that simply will not function. It will take a long time, lost lives and many resources to rebuild; our nation's security will be hurt, not furthered by such precipitous defense cuts.

If we choose wisely today, we can do well something America has always done badly before—we can draw down our military force at a responsible rate that will not end up endangering our security. We did not do this well after World War II, and we found ourselves unprepared for the Korean war barely five years later. We did not draw down intelligently after Vietnam, and we found ourselves with the hollow forces of the late '70s. We are determined to avoid repeating these costly errors.

Our future national security and the lives of young Americans of the next decade and beyond depend on our learning the proper lessons from the Persian Gulf war. It is a task the Department of Defense takes seriously. Those Americans lost in the Persian Gulf war and their families paid a heavy price for freedom. If we

make the wrong choices now—if we waste defense dollars on force structure we cannot support or on more weapons than we need or on bases we cannot afford—then the next time young Americans go into combat we may not have the capabilities we need to win.

America can be proud of its role in the Persian Gulf war. There were lessons to be learned and problems to be sure. But overall there was an outstanding victory. We can be proud of our conviction and international leadership. We can be proud of one of the most remarkable deployments in history. We can be proud of our partnership in arms with many nations. We can be proud of our technology and the wisdom of our leaders at all levels. But most of all we can be proud of those dedicated young Americans—soldiers, sailors, airmen and marines—who showed their skill, their commitment to what we stand for, and their bravery in the way they fought this war.

A handwritten signature in dark ink, reading "Dick Cheney". The signature is written in a cursive, flowing style. The first name "Dick" is written with a large, open 'D' and a small 'i'. The last name "Cheney" is written with a large 'C' and a trailing flourish.

PREFACE

The final report to Congress on the conduct of hostilities in the Persian Gulf (pursuant to the requirements of Title V of the Persian Gulf Supplemental and Personnel Benefits Act of 1991) is divided into three volumes. The first volume deals with the nature of Iraqi forces, Operation Desert Shield, the Maritime Interception Operations and Operation Desert Storm. The second and third volumes contain appendices dealing with specific issues.

Discussion in volume I focuses on how the threat in the Persian Gulf developed and how the United States and its Coalition partners responded to that threat at the strategic, operational, and tactical levels. The narrative is chronological to the extent possible. In this sense, it touches on issues such as logistics, intelligence, deployment, the law of armed conflict, and mobilization, among others, only as those issues have a bearing on the overall chronicle.

This is not to suggest that other issues are not important. In fact, examination of these issues is of great substantive value to future security plans and programs. To provide ready access to this information, discussions of specific issues have been structured into appendices and collected in Volumes II and III. The intent is to provide as much detail as possible about a specific issue in one location. For all intents and purposes, the appendices are independent documents and with enough background to let the reader concerned with a particular area read the appropriate appendix and forego other parts of the report. Where cross-referencing or overlapping occurs, it is to achieve that objective.

The content of all volumes of this report is the result of extensive research conducted through review of original source documents (such as orders, plans, estimates, and appraisals); information from the Office of the Secretary of Defense, Joint Staff, the United States Central Command, other unified and specified commands, component commands, and the military Services; and, in-depth interviews with many senior officers and policy makers involved in Operations Desert Shield and Desert Storm. Research to determine what lessons ought to be taken from the crisis began before the conflict ended. Throughout, officials at all levels willingly provided information. However, this conflict was exceptionally well documented compared with previous crises. Many data points remain in raw form and information on some aspects of the campaigns remains uncollated and unevaluated. The volume of available documents, perhaps in the millions of pages, will provide researchers with data for a number of years. Therefore, while the depictions, conclusions, and evaluations presented in this report are based on a thorough examination of the existing evidence, they are subject to modification as additional research makes more information available.

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A Note on Preparation of the Title V Report

Preparation of the interim and final versions of this report entailed an intensive twelve month effort involving hundreds of individuals. It was prepared under the auspices of Honorable Paul Wolfowitz, Under Secretary of Defense for Policy. The overall effort was directed by Mr I. Lewis Libby, Principal Deputy Under Secretary of Defense for Strategy and Resources. Policy guidance was provided by Dr Zalmay Khalilzad, Assistant Deputy Under Secretary of Defense for Policy Planning.

The report was produced in consultation with the Chairman of the Joint Chiefs of Staff and the Commander-in-Chief, United States Central Command. Joint Staff efforts were directed by Rear Admiral David B. Robinson, USN, and Major General Alan V. Rogers, USAF, the Directors of Operational Plans and Interoperability (J-7). They were assisted by Colonel David L. Vesely, USAF; Colonel Douglas C. Lovelace Jr., USA; Lieutenant Colonel Daniel J. Pierre, USAF; Commander Stephen G. Gardner, USN; and Lieutenant Colonel Robert E. Nedergaard, USAF. Major General Burton R. Moore, USAF, Operations Directorate (J-3) directed contributions of the United States Central Command. He was assisted by Lieutenant Colonel Garry P. McNiesh, USA.

The Title V Report was researched, coordinated, and written by a joint team which was headed by Colonel George T. Raach, USA. Team members were: Colonel Phillip H. Bates, USAR; Colonel John R. Bioty Jr., USMC; Captain Paul W. Hanley, USN; Colonel Michael Peters, USA; Colonel Joe W. Robben, USMC; Captain Jerry Russell, USNR; Colonel Edward Soriano, USA; Captain A.H. White, USN; Lieutenant Colonel Edward A. Bondzeleske, USAF; Lieutenant Colonel Charles E. Byrd, USAF; Lieutenant Colonel Scott K. Gordon, USAF; Lieutenant Colonel Bernard E. Harvey, USAF; Lieutenant Daniel T. Kuehl, USAF; Lieutenant Colonel Gregory S. Laird, USA; Lieutenant Colonel Gerard J. Monaghan, USAR; Lieutenant Colonel John Peters, USA; Lieutenant Colonel Claudio J. Scialdo, USAR; Lieutenant Colonel Lloyd M. Scott, USA; Lieutenant Colonel Kenneth R. Straffer, USA, (ret); Major Richard C. Francona, USAF; Major Richard S. Moore, USMC; Major Alexander D. Perwich II, USA; Major David K. Swindell, USA; Captain Ralph A. Butler, USA; Lieutenant Gregory T. Maxwell, USN; and, Captain Kevin V. Wilkerson, USA; Lieutenant Gail Curley, USA; and Cadet Patrick R. Brien, USAFA.

Lieutenant General Dale A. Vesser, USA, (ret), Assistant Deputy Under Secretary for Resources and Plans, and Captain Larry R. Seaquist, USN, Assistant to the Principal Deputy Under Secretary of Defense for Strategy and Resources, also played a valuable role in the production of this report. Assisting Dr Khalilzad in his supervision of the report were Dr Wade P. Hinkle, his deputy, and Dr Abram N. Shulsky of the Policy Planning Staff, and Ms Carol Kuntz, Special Assistant to the Principal Deputy Under Secretary of Defense for Strategy and Resources.

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CHAPTER I

THE INVASION OF KUWAIT

"Without warrant or warning, Iraq has struck brutally at a tiny Kuwait, a brazen challenge to world law. Iraq stands condemned by a unanimous UN Security Council...President Bush's taste for bluntness stands him in good stead: "Naked Aggression!" is the correct term for President Saddam Hussein's' grab at a vulnerable, oil-rich neighbor."

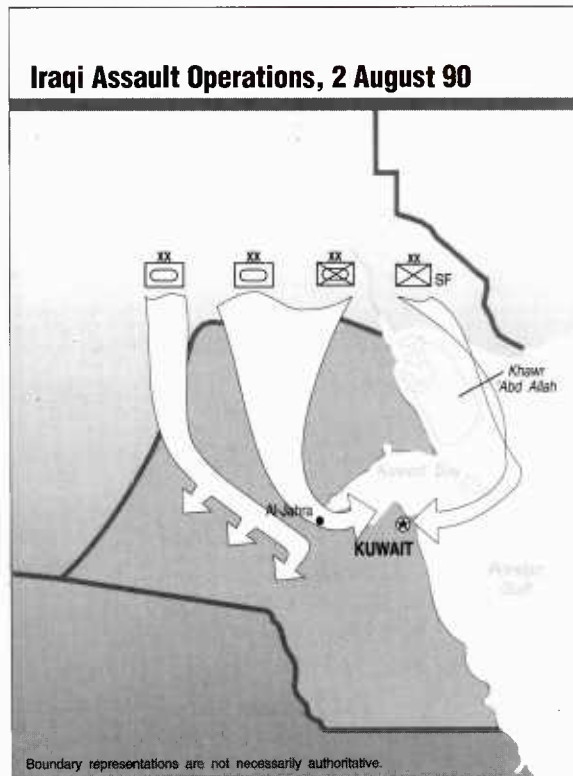
New York Times
3 August 1990

At 0100 (Kuwait time), 2 August, three Iraqi Republican Guard Forces Command (RGFC) divisions attacked across the Kuwaiti frontier. A mechanized infantry division and an armored division conducted the main attack south into Kuwait along the Safwan-'Abdally axis, driving for the Al-Jahra pass. Another armored division conducted a supporting attack farther west. Almost simultaneously, at 0130, a special operations force conducted the first attack on Kuwait City – a heliborne assault against key government facilities. Meanwhile, commando teams made amphibious assaults against the Amir's palace and other key facilities. The Amir was able to escape into Saudi Arabia, but his brother was killed in the Iraqi assault on the Dasman Palace.

The three attacking armored and mechanized formations, supported by combat aircraft, linked up at Al-Jahra. The two divisions conducting the main attack continued east to Kuwait City, where they joined the special operations forces by 0530. By 1900, Iraqi forces had secured the city. Concurrently, the supporting armored division moved south from Al-Jahra to establish blocking positions on the main avenues of approach from the Saudi border. By the evening of 2 August, Iraqi tanks were moving south of the capital along the coast to occupy Kuwait's ports.

Kuwaiti armed forces were no match for the assembled Iraqi force. Although Kuwaiti armed forces had gone on full alert after Saddam Hussein's 17 July speech, they reduced alert levels a week later to 25 percent. This may have been done in an attempt to reduce the tension between Kuwait and Iraq. Kuwaiti military resistance was uncoordinated; despite individual acts of bravery, Kuwaiti forces were hopelessly outmatched. Army elements attempted to recapture the Amir's palace, and 35th Armored Brigade tanks tried to mount a defense against approaching Republican Guard armored formations. Kuwaiti casualties are estimated to have been light, but specific numbers are unknown. Some Kuwaiti forces

¹ Although the Arabic letters Hah (dammah)-Sin (fathah)-Yah-Nun are best rendered as HUSAYN, hereafter this document reflects the more commonly used HUSSEIN.



Map I-1

successfully retreated across the Saudi border as defenses collapsed. Kuwait Air Force pilots flew limited sorties against attacking Iraqi units, but were forced to recover in Saudi Arabia or Bahrain, since the two Kuwaiti air bases had been overrun. By midday, 3 August, Iraqi forces had taken up positions near the Kuwaiti-Saudi border. (Map I-1)

On 4 August, Iraqi tanks were establishing defensive positions. Hundreds of logistics vehicles were moving men and massive quantities of munitions and supplies south. RGFC infantry divisions that had been deployed to the border area in late July moved into Kuwait, occupied Kuwait City, and secured the primary lines of communications to and from southern Iraq. By this time, more Iraqi divisions were moving south to Kuwait from garrisons in Iraq. These forces would replace the RGFC units in defensive positions in Kuwait. This replacement was ominous for, while it allowed a possible return of RGFC units to Iraq, it also freed these formations for a subsequent attack into Saudi Arabia, should Saddam order it.

GEOGRAPHY OF KUWAIT

Kuwait, a country slightly smaller than New Jersey, consists of flat to slightly undulating desert plains. It has almost no defensible terrain. The only significant elevation in the country is the Al-Mutl'a Ridge, just north of the city of Al-Jahra. A pass in this ridge at Al-Jahra is the traditional defensive position against an approach from the north. British troops occupied the position in the 1961 defense of Kuwait when Iraq threatened to seize the newly independent country. In the Gulf War, Iraqi troops mined and fortified this pass as a defense against potential Coalition attacks north toward the Iraq-Kuwait frontier.

By 6 August, the Iraqis had consolidated their gains and were resupplying their forces, another indication Iraq might continue its drive south. At this point, elements of at least 11 divisions were either in or entering Kuwait. This amounted to more than 200,000 soldiers, supported by more than 2,000 tanks. Two days later, Saddam announced the annexation of the country, describing Kuwait as the "19th Province – an eternal part of Iraq." (Map I-2)

PRELUDE TO CRISIS

Emerging from the Iran-Iraq war at the helm of the dominant military power in the Gulf, Saddam saw himself as the premier leader in (and of) the Arab world. In April 1990, claiming an enlarged regional role, Saddam had demanded withdrawal of US forces from the Gulf, claiming there no longer was any need for foreign presence in the region. On 1 July, Saddam declared Iraq now had binary chemical weapons (CW) – "a deterrent sufficient to confront the Israeli nuclear weapon." At the same time, the Iraqi leader made several threatening speeches, turning his attention to his Arab neighbors, claiming Iraq alone had defended the "Arab nation" against the age-old Persian threat.

On 17 July, Saddam accused Kuwait and the United Arab Emirates of complicity with the United States to cheat on oil production quotas. He blamed this overproduction for driving down the price of oil, causing losses of billions of dollars to Iraq. During this period, the Iraqi million-man armed forces and aggressive research and development programs (including Iraq's large nuclear development effort) were consuming enormous sums of money. Iraq's 1990 military budget was \$12.9 billion, or approximately \$700 per citizen in a country where the average annual income was \$1,950. By mid 1990, Iraq had only enough cash reserves for three months of imports and an inflation rate of 40 percent.



Map I-2

Iraq largely had financed the military expenditures of the war with Iran through loans. By 1990, creditors were reluctant to extend new development loans until substantial parts of the old debt were paid. Many loans were in serious arrears, especially those made by other Arab states. Iraq's Arab neighbors were reluctant to write off more than \$37 billion in loans made to Iraq. Baghdad did not believe it necessary to repay immediately what it considered "soft" loans from Gulf Cooperation Council members. (Saddam argued Iraq had gone to war with Iran to protect the Arabian Peninsula from the threat of Iranian expansionism. Thus, according to this argument, Gulf states ought not dun Iraq for expenses incurred on their behalf.) If not rescheduled, the required annual principal and interest payments on the non-Arab debt alone would have consumed more than half of Iraq's estimated \$13 billion 1989 oil revenues. Debt service in subsequent years would have had an equally deleterious effect.

Iraq's large expenditures on its military forces both aggravated its financial distress and provided the muscle with which to intimidate its rich, but weak, neighbor Kuwait. Saddam initially demanded money from Kuwait; this demand was rejected by the Kuwaiti Amir, who instead offered a small, long-term loan. Iraq



"He who launches an aggression against Iraq or the Arab nation will now find someone to repel him. If we can strike him with a stone, we will. With a missile, we will...and with all the missiles, bombs, and other means at our disposal."

18 April 1990

IRAQ'S SADDAM: THE PRESIDENT-LEADER-MARSHAL

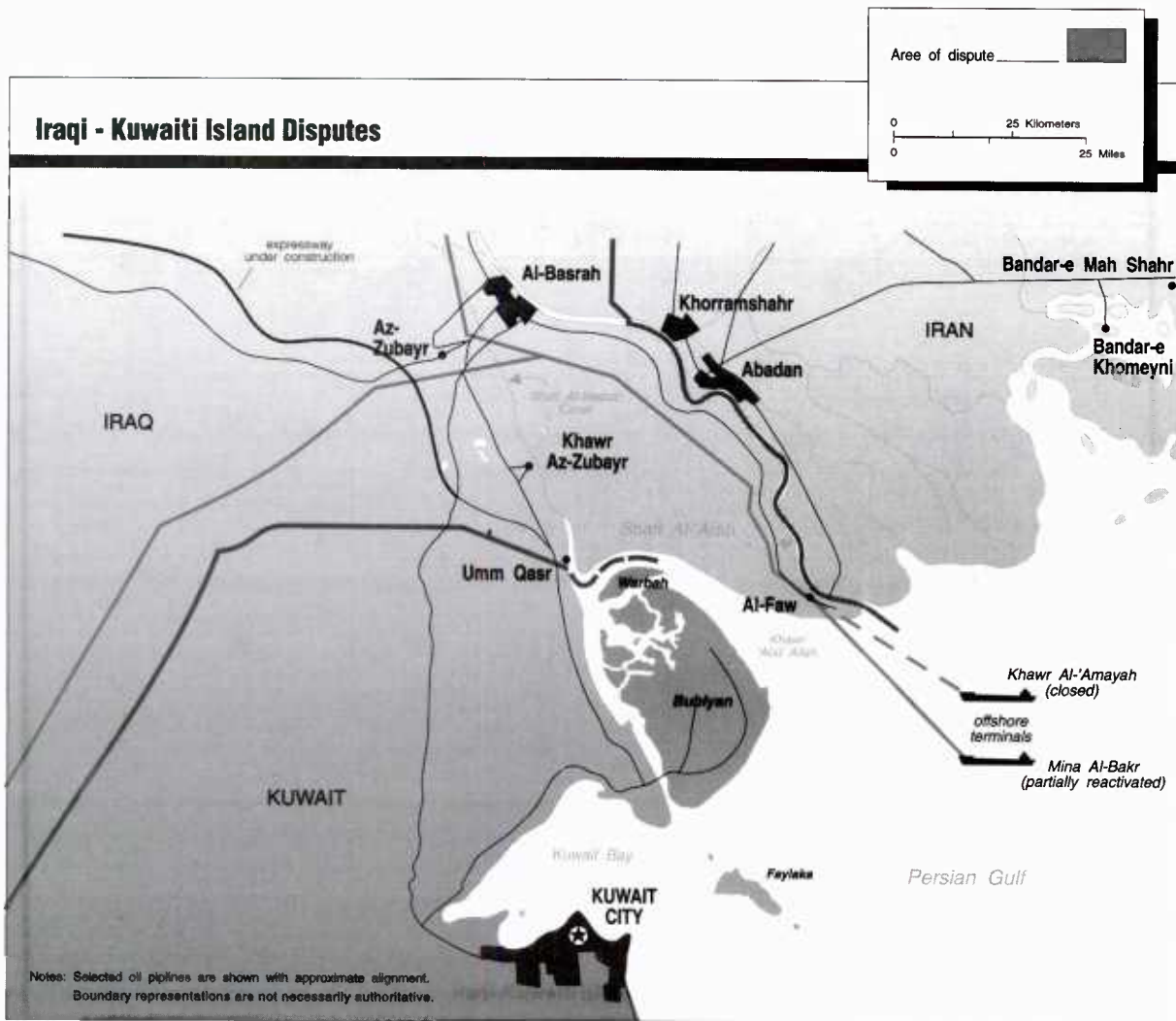
Saddam was born on 28 April 1937 near Tikrit and was raised in the home of his maternal uncle, after the breakup of his parents' marriage. After his bid to attend the Iraqi national military academy was rejected, an embittered Saddam turned to the Ba'ath Party. As a Party member, he took part in the aborted assassination attempt against the ruler of Iraq in 1959. Wounded in the attack, he escaped Iraq and made his way to Syria, and in 1961, to Egypt, where he reportedly attended college. He returned in 1963, after a successful Ba'ath coup in Baghdad. When the Ba'athis were ousted later that same year, Saddam was arrested and spent two years in prison. He escaped and spent two years underground, planning the successful 17 July 1968 coup. Saddam became vice chairman of the Revolutionary Command Council and *de facto* ruler of Iraq by eliminating any opposition. In July 1979, he convinced then-President Ahmad Hassan Al-Bakr to resign, and was named President of the Republic, Chairman of the Revolutionary Command Council, Supreme Commander of the Armed Forces, and Secretary General of the Ba'ath Party.

again raised the long-standing question of ownership of the islands of Warbah and Bubiyan, which it claimed are important for secure access to its ports on the Khawr 'Abd Allah – the waterway leading to the Persian Gulf that is the only alternative to the closed Shatt Al-'Arab, cluttered with debris from the Iran-Iraq war, sunken vessels, tons of unexploded ordnance (including nerve and blister agent rounds), and more than 10 years of silting. Iraq's limited access to the sea had forced the country to rely on its neighbors' ports since the Shatt was closed in 1980. (For example, Iraq's energy sector depended on the cooperation of Turkey and Saudi Arabia, whose ports handled 90 percent of Iraqi oil exports.) Efforts to clear the Shatt had been stymied by cost and difficulty. An Iraqi-built canal from Al-Basrah to Az-Zubayr could not handle large oil export vessels. In any case, vessels using this waterway must pass near the Kuwaiti islands of Warbah and Bubiyan. If held by a hostile government, the islands effectively could deny Iraqi access to the Persian Gulf. Kuwait, however, had taken no action to deny Iraq access to the Gulf.

Iraq had demanded repeatedly the two islands be transferred or leased to it. On 20 March 1973, Iraqi troops seized the Kuwaiti border post of As-Samitah and Iraq announced it was annexing a small strip of Kuwaiti territory near the Iraqi port city of Umm Qasr. Saudi Arabia immediately came to Kuwait's aid and, with the Arab League, secured Iraq's withdrawal. There was a minor border incident in this area in 1983, but this issue was temporarily shelved in 1984 because of the pressures of the war with Iran – Baghdad needed access to Kuwait's ports to import weapons and ammunition. (Map I-3)

The issue of Bubiyan and Warbah islands was only part of the history of contention between Iraq and Kuwait. In 1961, when Great Britain ended its protectorate over Kuwait, then Iraqi Prime Minister 'Abd Al-Karim Qasim asserted that Kuwait is an "integral part of Iraq," because it had been part of the former Ottoman province of Al-Basrah. Iraq threatened to exert its sovereignty over Kuwait, but the resulting deployment of British troops to Kuwait forced the Iraqis to back down. Although subsequent regimes have relinquished this claim by recognizing Kuwait's independence, Iraq never agreed formally to accept the existing boundary between the two countries. Iraq, in 1990, also claimed Kuwait was illegally extracting oil from the Iraqi-claimed Ar-Rumaylah oil field, which straddles the *de facto* boundary.

As the situation in July 1990 escalated from a war of words to deployment of a massive Iraqi force north of Kuwait, Arab leaders sought to resolve the crisis peacefully. Egyptian President Husni Mubarak and Saudi King Fahd offered their good offices. These leaders arranged a meeting between Kuwaiti and Iraqi officials in Jiddah, Saudi Arabia, on 1 August. But the Iraqi representative, Izzat Ibrahim Ad-Duri, walked out, complaining of Kuwaiti reluctance to discuss Iraqi claims to the islands or to forgive Iraq's debt to Kuwait. The Iraqi Deputy Prime Minister claimed "no agreement has been reached on anything because we did not feel from the Kuwaitis any seriousness in dealing with the severe damage inflicted on Iraq as a result of their recent behavior and stands against Iraq's basic interests."

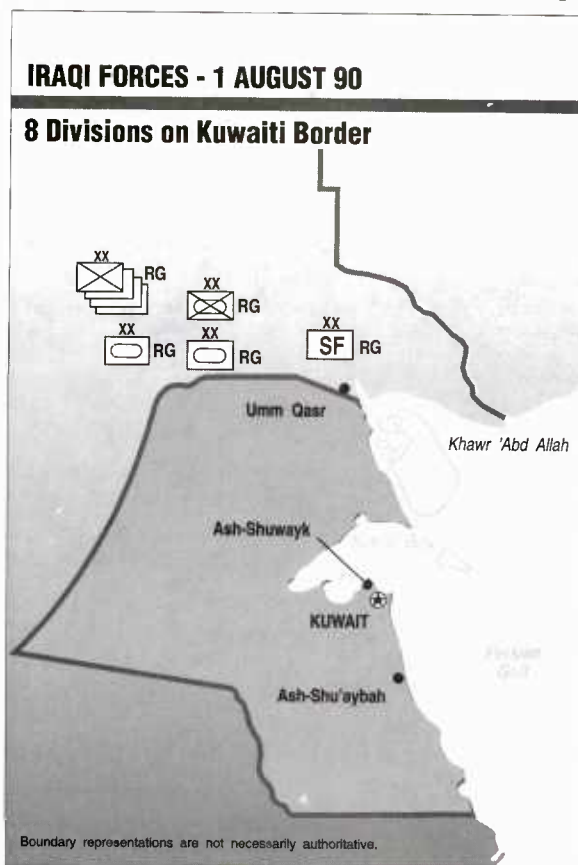


Map I-3

Kuwait quite reasonably rejected Iraq's demands for money and territory. It had sought to ameliorate the crisis by concessions at the negotiation table. These concessions included guaranteed loans to the Iraqi government, and sharing of revenue derived from the Ar-Rumaylah oil field. By this time, however, Iraqi forces were on the move. Senior Iraqi military officers captured during Operation Desert Storm claimed the decision to invade had been made already in Baghdad.

In fact, Iraqi Republican Guard units had begun moving from garrisons around Baghdad as Saddam made his 17 July speech accusing Kuwait (among others) of cheating Iraq of oil revenue and of occupying territory belonging to Iraq. By 21 July, a RGFC armored division had deployed just north of Kuwait. There were reports that as many as 3,000 military vehicles were on the road leading south from Baghdad to the Kuwaiti border. In two weeks, the bulk of the combat power of Iraq's best

military force – the Republican Guard – was moved hundreds of kilometers into positions that would permit an attack into Kuwait with almost no warning.



Map I-4

By 1 August, there were eight RGFC divisions (two armored, one mechanized, one special forces and four infantry) between Al-Basrah and the Kuwaiti border. The rapidity of this buildup indicated the quality and extent of Iraqi staff planning. Some units had moved as far as 700 kilometers from their home bases. The Iraqis had assembled almost 140,000 troops, supported by more than 1,500 tanks and infantry vehicles, plus the required artillery, and logistics. Iraqi air assets in the area increased as well. Attack, fighter, and fighter-bomber aircraft moved into southern air bases, as did assault helicopters. Air defense systems were deployed to protect the assembling attack force. (Map I-4)

In retrospect, it appears Iraq probably never intended to come to terms with Kuwait through negotiation. Rather, it may well have been that, in Iraq's view, the late-July political maneuverings and 1 August talks in Jiddah were only a pretext to

provide time for final preparations and to give an air of legitimacy to the coming invasion.

IRAQI MILITARY CAPABILITIES, 1990

At the time of the invasion of Kuwait, the Iraqi armed forces were, by any measure, a formidable and battle-tested fighting force. Iraq began the crisis with one of the world's larger armies, equipped with great numbers of tanks, armored personnel carriers and artillery, some of which were state-of-the-art models. It had a sizable air force with many top-line fighters and fighter-bombers (F-1s, MiG-29s and Su-24s) and a modern air defense command and control (C2) system. During the last six months of the Iran-Iraq war, the Iraqi army had demonstrated a capability to conduct multi-axis, multi-corps, combined-arms operations deep into hostile territory. The staff could conduct long-range planning; coordination of air and artillery preparations; timing of movements and operations; coordination of complicated logistics requirements; and movement of supplies, equipment, and troops to the right place at the designated time. They had developed excellent operational security and deception.

Iraqi armed forces were structured similarly to the British forces, but their operations were modeled more closely on Soviet armed forces. The senior military echelon in Iraq is the General Headquarters (GHQ), which integrates operations of the Republican Guard, Army, Navy, Air and Air Defense Forces, and Popular Army. It is dominated by ground force officers.

Iraqi ground forces were the largest in the Persian Gulf at the time of the invasion of Kuwait. They included the Republican Guard Forces Command, the regular Army, and the Popular Army. Iraqi ground forces had more than 5,000 main battle tanks, 5,000 armored infantry vehicles, and 3,000 artillery pieces larger than 100mm. These forces were supported by enough heavy equipment transporters to move a three-division heavy corps at one time. Iraqi troops were well practiced in conducting short-notice division moves across considerable distances, as well as other tactical operations.

The Iraqi military supply and transportation infrastructure was extensive and well-equipped, with ample supplies of ammunition, water, food and fuels. A modern transportation system had been built inside Iraq during the Iran-Iraq war to ease unit movement to and from combat areas and to keep them supplied. The logistic system was a hybrid of the Soviet system, in which materiel is delivered forward from higher echelons before it is needed, and the British system, in which lower echelons draw materiel as needed. In the Iraqi system, materiel was sent automatically from GHQ to the corps, based on estimated consumption requirements. Once at the corps depot, divisions and brigades drew replenishment supplies.

OVERVIEW OF THE IRAN-IRAQ WAR

After the fall of the Shah and the rise to power of the Ayatollah Ruhollah Khomeini, relations between Tehran and Baghdad deteriorated quickly. Khomeini called for the overthrow of Iraq's Ba'ath Party, actively supported anti-Ba'ath groups, and aided assassination attempts against senior Iraqi officials. Conversely, Iraq saw an opportunity to abrogate the 1975 Algiers Treaty, which had established joint Iraqi-Iranian control over the Shatt Al-'Arab by delineating the international border at the center of the navigable channel. Iraq believed its troops could defeat the Iranian armed forces, badly disintegrated by the Iranian revolution.

Iraq launched a two-corps attack into Iran in September 1980 and captured Iranian territory in the Arabic-speaking, oil-rich area of Khuzistan. Saddam expected the invasion to result in an Arab uprising against Khomeini's fundamentalist Islamic regime. This revolt did not materialize, however, and the Arab minority remained loyal to Tehran. After a month of advances, the Iraqi attack stalled; for a time, the situation was characterized by small attacks and counterattacks, with neither side able to gain a distinct advantage. In 1982, when a major offensive failed, Saddam ordered a withdrawal to the international borders, believing Iran would agree to end the war. Iran did not accept this withdrawal as the end of the conflict, and continued the war into Iraq.

Believing it could win the war merely by holding the line and inflicting unacceptable losses on the attacking Iranians, Iraq initially adopted a static defensive strategy. This was successful in repelling successive Iranian offensives until 1986 and 1987, when the Al-Faw peninsula was lost and Iranian troops reached the gates of Al-Basrah. Embarrassed by the loss of the peninsula and concerned by the threat to his second largest city, Saddam ordered a change in strategy. From a defensive posture, in which the only offensive operations were counterattacks to relieve forces under pressure or to exploit failed Iranian assaults, the Iraqis adopted an offensive strategy. More decision-making authority was delegated to senior military commanders. The success of this new strategy, plus the attendant change in doctrine and procedures, virtually eliminated Iranian military capabilities. The change also indicated a maturing of Iraqi military capabilities and an improvement in the armed forces' effectiveness.

Four major battles were fought from April to August 1988, in which the Iraqis routed or defeated the Iranians. In the first offensive, named Blessed Ramadhan, Iraqi Republican Guard and regular Army units recaptured the Al-Faw peninsula. The 36-hour battle was conducted in a militarily sophisticated manner with two main thrusts, supported by heliborne and amphibious landings, and low-level fixed-wing attack sorties. In this battle,

(Continued on Page 11)

OVERVIEW OF THE IRAN-IRAQ WAR (CONTINUED)

the Iraqis effectively used chemical weapons (CW), using nerve and blister agents against Iranian command and control facilities, artillery positions, and logistics points.

Three subsequent operations followed much the same pattern, although they were somewhat less complex. After rehearsals, the Iraqis launched successful attacks on Iranian forces in the Fish Lake and Shalamjah areas near Al-Basrah and recaptured the oil-rich Majnun Islands. Farther to the north, in the last major engagement before the August 1988 cease-fire, Iraqi armored and mechanized forces penetrated deep into Iran, defeating Iranian forces and capturing huge amounts of armor and artillery. In the fall of 1988, the Iraqis displayed in Baghdad captured Iranian weapons amounting to more than three-quarters of the Iranian armor inventory and almost half of its artillery pieces and armored personnel carriers.

Iraq's victory was not without cost. The Iraqis suffered an estimated 375,000 casualties, the equivalent of 5.6 million for a population the size of the United States. Another 60,000 were taken prisoner by the Iranians. The Iraqi military machine – numbering more than a million men with an extensive arsenal of CW, extended range Scud missiles, a large air force and one of the world's larger armies – emerged as the premier armed force in the Persian Gulf region. In the Middle East, only the Israel Defense Force had superior capability.

Republican Guard Forces Command

The RGFC was Iraq's most capable and loyal force, and had received the best training and equipment. It began as an elite organization tasked with regime protection. This organization served as the core around which to build an elite offensive force, which grew dramatically during the last two years of the war with Iran. Personnel recruited into the RGFC were given bonuses, new cars and subsidized housing. At the end of the war with Iran, the RGFC consisted of eight divisions. Combined with its independent infantry and artillery brigades, the RGFC comprised almost 20 percent of Iraqi ground forces. Most RGFC heavy divisions were equipped with Soviet T-72 main battle tanks, Soviet BMP armored personnel carriers, French GCT self-propelled howitzers and Austrian GHN-45 towed howitzers— all modern, state-of-the-art equipment. RGFC armored battalions had nine more tanks than Army tank battalions, giving them added firepower. Otherwise, the organization of combat arms units in the Guard and regular Army appeared identical.

The RGFC was subordinate to the State Special Security Apparatus, not the Defense Ministry; it was believed to be under GHQ operational control during combat. Although the Guard and regular Army were maintained as separate institutions, they had demonstrated the ability to fight effectively in the same offensive or defensive operation. The RGFC was the major assault force in each of the 1988 multi-corps offensive operations that reclaimed the Al-Faw peninsula, Fish Lake and the Majnun Islands from the Iranians. In these operations, regular forces fixed the enemy while the RGFC attacked. These offensive operations in 1988 were notable for their detailed preparation and planning.

The Guard's defensive mission was strategic reserve, withheld until it could influence the battle decisively with a counterattack, or shore up collapsing Army positions. To prevent the fall of Al-Basrah in 1987, 12 Guard brigades were committed to battle. Without the determined RGFC defense, the Iranians would have penetrated the Iraqi lines. In early 1988, RGFC elements again were sent hurriedly to shore up a weakness in the Al-Basrah defenses in anticipation of an expected Iranian offensive. GHQ usually reserved authority to commit the RGFC to battle. The RGFC also was an important political force supporting Saddam, used to counterbalance the regular Army in case of revolt or to deal with civil unrest.

Army

The regular Army in mid-1990 consisted of more than 50 divisions, additional special forces brigades, and specialized forces commands composed of maneuver and artillery units. Although most divisions were infantry, the Army had several armored and mechanized divisions. Some armored units had a small amount of modern Western and Soviet equipment, but most of the Army had 1960s-vintage Soviet and Chinese equipment. Training and equipment readiness of Army units varied greatly, ranging from good in the divisions that existed before the Iran-Iraq war, to poor in the largely conscript infantry formations.

The basic operational level formation was the corps, which consisted of several divisions and support units. Iraqi Army divisions were of three basic types: armored, mechanized and infantry. Divisions normally consisted of three brigades, division artillery, air defense, reconnaissance, combat support and combat service support units, although temporary assignment of other units was common. Armored and mechanized divisions were triangular in organization; armored divisions had two armored brigades and a mechanized brigade, while mechanized divisions had two mechanized brigades and an armored brigade. Infantry divisions were assigned three infantry brigades and a tank battalion. Iraqi divisions had at least four artillery battalions, but often were augmented by additional battalions. Armored and mechanized brigades normally consisted of four battalions. Armored brigades had three tank and one mechanized battalions, while a mechanized brigade had three mechanized and one tank battalion.

Popular Army

The Popular Army was created in 1970 as the Ba'ath Party militia. These units were poorly trained and equipped and, in August 1990, numbered approximately 250,000, down from 650,000 during the war with Iran. Originally restricted to party members, the Popular Army's mission was to secure the Ba'ath regime against internal opposition and provide a power base for the regime in case of a regular Army uprising. During the war with Iran, nonparty members were inducted into the ranks and as many as 100,000 Popular Army members were integrated into the regular Army and served for limited periods on the front lines. By 1990, however, membership once again was restricted to Ba'ath Party members and its mission restricted to rear area security.

Air Force

In terms of numbers of combat aircraft, the Iraqi Air Force was the largest in the Middle East in August 1990. The quality of the aircraft and aircrew, however, was very uneven. Its effectiveness was constrained by the conservative doctrine and aircraft systems limitations. While Iraqi pilots performed some impressive, relatively complex strikes with the F-1, air-to-air engagements were unimpressive. Lock on by Iranian fighters generally would cause Iraqi pilots conducting offensive counter air missions to abort their missions. Survival dominated their tactics, even when the odds were overwhelmingly in their favor. Aerial engagements were characterized by high-speed, maximum-range missile launches, and a lack of aggressive maneuvering. Saddam had proven reluctant to commit the air force to combat, preferring to keep it in reserve for a final defense of Baghdad and the regime. The Iraqi Air Force had been used most effectively in the war with Iran against economic targets such as oil facilities and tankers. During the war, tactics evolved from high-altitude level bombing to low-level attacks with precision guided munitions (PGMs). Iraq not only imported cluster bombs and fuel-air explosives, but also had acquired the technology to produce these weapons. Pilots had become adept at delivering both conventional and chemical-filled munitions during the final 1988 offensives.

Iraq had more than 700 combat aircraft in its inventory before the invasion of Kuwait. Fewer than half of these aircraft were either third generation (comparable to the US F-4) or fourth generation (comparable to US F-15 technology), and were flown by pilots of marginal quality, compared with US aviators. These aircraft included the Soviet MiG-29 and Su-24 (both fourth generation) as well as the MiG-23, MiG-25, and the French F-1 (third generation). The rest of the aircraft were 1950s and 1960s Soviet and Chinese technology, and were flown by poorly trained personnel. Nevertheless, under the proper conditions, even the older aircraft models were effective.

The 65 French-built F-1s and their pilots were the Iraqi Air Force elite. Iraq had acquired a wide range of weapons and electronic warfare gear for the F-1, including laser-guided air-to-surface missiles. French-trained pilots exhibited a high degree of skill and determination when attacking Iranian surface targets, and were more willing to engage in air-to-air combat than their colleagues flying Soviet-built aircraft. It was an Iraqi F-1 that fired two Exocet antiship missiles at the *USS Stark* (FFG 31) in 1987. During the Iraqi offensives of 1988, F-1s equipped with PGMs attacked Iranian armaments factories, oil refineries and facilities, bridges and causeways, as well as merchant shipping in the Gulf.

Iraqi aircraft were deployed at more than 24 primary and 30 dispersal airfields throughout the country. The main operating bases were well constructed, built to withstand conventional attack. The Iraqis could shelter almost all their aircraft in hardened shelters, some built by Yugoslav contractors to standards believed to be able to withstand the effects of air burst detonations of tactical nuclear weapons. Other air base facilities were placed in hardened shelters or took advantage of natural protection, such as caves.

Air Defense Forces

Iraqi air defenses were redesigned after the Israeli raid on the Osirak nuclear reactor in 1981. A network of radars, surface-to-air missiles (SAM) and antiaircraft artillery (AAA) was installed, primarily concentrated around strategic and industrial facilities in the Baghdad area. The national air defense operations center (ADOC) in downtown Baghdad controlled Iraq's air defenses. The ADOC maintained the overall air picture in Iraq and established priorities for air defense engagements. Subordinate to this facility were sector operations centers (SOC), each controlling a specific geographic area. The SOC and the ADOC were connected by the French-built Kari command and control system. This modern, computerized system linked the diverse inventory of Soviet and Western radar and air defense weaponry. It provided a redundant C2 capability.

Air defense weaponry included SA-2, SA-3, SA-6 and Roland SAM systems. Additional air defense was provided by Air Force interceptors and organic Army assets, including the SA-7/14, SA-8, SA-9/13, SA-16 missile systems, and the ZSU-23/4 self-propelled AAA system. In addition, the Iraqi air defense had more than 7,500 AAA pieces protecting all targets of value, some deployed on the roofs of numerous buildings in Baghdad housing government facilities. These weapons – 57-mm and 37-mm AAA pieces, ZSU-23/4 and ZSU-57/2 self-propelled AAA systems, and hundreds of 14.5-mm and 23-mm light antiaircraft weapons – formed the backbone of the integrated air defense network. In major high value target areas (such as Baghdad, airfields, chemical agent production complexes, and nuclear facilities) the combined arms air defense could prove lethal to aircraft operating below 10,000 feet.

The Iraqi air defense system was formidable, combining the best features of several systems. The multi-layered, redundant, computer-controlled air defense network around Baghdad was more dense than that surrounding most Eastern European cities during the Cold War, and several orders of magnitude greater than that which had defended Hanoi during the later stages of the Vietnam War. If permitted to function as designed, the air defense array was capable of effective protection of key targets in Iraq.

Navy

The navy consisted of a collection of Osa guided-missile patrol boats and numerous auxiliaries. Iraq's Soviet-built Osas were outfitted with the Styx missile with a maximum range of 46 or 95 kilometers, depending on the variant. While offensive capabilities were limited, the navy also had the 100-km range Silkworm surface-to-surface missile, whose half-ton warhead could sink a frigate or damage a battleship.

Another weapon in the Iraqi naval arsenal was a diverse inventory – numbering in the thousands – of moored contact and bottom influence mines. Iraqi mines were both imported and indigenously produced, reverse-engineered copies of at least five foreign models. Iraq's minelayers could lay extensive minefields in a nonhostile environment. Moored contact mines detonate when struck and normally are positioned at or below the water line, making detection possible but often difficult. Bottom influence mines, on the other hand, are extremely difficult to detect because they are laid on the ocean floor. They can be programmed to detonate in response to a variety of conditions, such as acoustic or magnetic stimuli, or after a designated number of ships have passed. The effect of a bottom influence mine is much more devastating than that of a contact mine.

Iraq realized the weakness of its navy; however, financial and political problems prevented timely correction. In 1980, Iraq signed a \$1.8 billion contract with Italy for delivery of four Lupo class frigates, six Esmerelda class corvettes, one Stromboli class replenishment oiler, and one floating dry dock. These vessels had not been delivered by the time of the invasion of Kuwait. Further, Iran stated that any attempt to bring the vessels to the Gulf would provoke an Iranian effort to block their passage.

Short Range Ballistic Missiles

The Iraqis had launched almost 200 Al-Husayn missiles at targets in Iran in the February-April 1988 "War of the Cities." The Iranians responded with fewer than 50 standard Scuds. This was the first time Baghdad could strike Tehran with missiles.

Because the circular error probable of the modified Scud missiles was approximately 3,000 meters, targets were Iranian cities rather than discrete military installations or facilities. Even with a small warhead, these attacks had great psychological impact on Tehran's population, causing almost one third of the residents to evacuate the city. It also gave the Iraqi population a psychological boost.

IRAQI MISSILE NAMES




Iraqi missiles were named for religious leaders or political causes. The first modified Scud produced by Iraq was named the Al-Husayn, for the grandson of the Prophet Muhammad and son of 'Ali. Both are revered in Shi'a Islam, whose adherents comprise the majority in Iraq. 'Ali was martyred in An-Najaf, and Husayn was killed in Karbala, both in Iraq and both now considered Shi'a holy places. Saddam is a Sunni; the name Al-Husayn may have been an attempt to appeal to the Shi'a population.

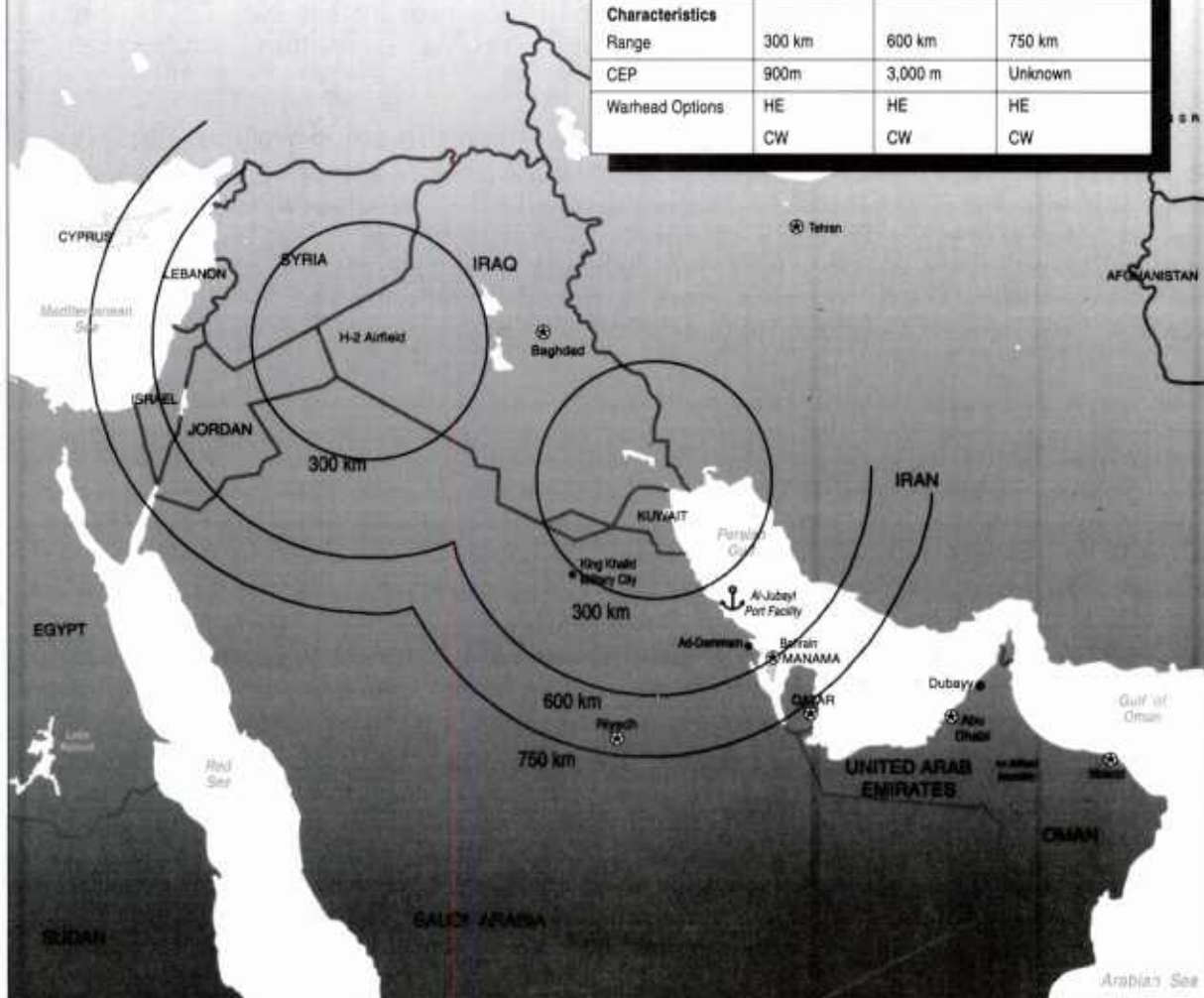
The Al-Hijarah, meaning "The Stones" was named for the Palestinian *intifadhah*, or uprising. The youth of the uprising are commonly known in the Arabic press as the "Children of the Stones." By naming the missile for the preferred weapon of the *intifadhah*, Saddam attempted to tie his weapons program (and anti-Israel stance) to the Palestinian problem.

By the middle of 1990, the Iraqis had the basic Soviet-supplied Scud missile, plus two indigenous variants. The Al-Husayn missile could reach targets at 600 kilometers, and the Al-Hijarah could reach targets as far as 750 kilometers. (The Al-Husayn and Al-Hijarah were used to attack Israel and Saudi Arabia in 1991.) Iraq's modified Scud missiles could be fired from standard Scud transporter-erector-launchers or Iraqi-produced mobile erector-launchers. The Iraqi Scud family of missiles could carry conventional (high explosive) or unitary and binary nerve agent warheads.

In February 1990, US intelligence detected Iraq construction of five Scud-type missile fixed launcher complexes in western Iraq. These complexes eventually contained 28 operational launchers. Assuming the standard 600-km flight trajectory of Iraqi-modified Scud missiles, missiles launched from the complexes could reach the Israeli cities of Tel Aviv, Haifa, and the nuclear facility at Dimona in the Negev desert. These sites also could strike targets in Syria and Turkey. (Map I-5)

Iraqi Missile Capabilities

12 meters			
8			
4			
0	Scud B	Al-Husayn	Al-Hijarah
Characteristics			
Range	300 km	600 km	750 km
CEP	900m	3,000 m	Unknown
Warhead Options	HE CW	HE CW	HE CW



Map I-5

Chemical Weapons

By 1990, Iraq had the largest chemical agent production capability in the Third World, annually producing thousands of tons of blister agent mustard and nerve agents Sarin (GB) and GF. Sarin, a nonpersistent agent, is relatively easy to produce from readily available chemical precursors. GF, a semipersistent nerve agent similar to Soman (GD), was produced by the Iraqi research and development establishment when Western nations restricted the export of chemical precursors required for Soman. Iraqi delivery means, in addition to missile warheads, included aerial bombs, artillery shells, rockets, and aircraft-mounted spray tanks. During the war with Iran, Saddam exhibited the willingness to use CW against not only the Iranians, but also his own Kurdish population. In the spring of 1988, Iraqi troops used CW against Iraqi Kurdish insurgents in the town of Halabjah. Thousands of civilian men, women, and children died.

Four years earlier, Iraq had become the first nation in history to use nerve agents on the battlefield. While the agent was not used effectively in 1984, by the beginning of 1988, the Iraqis had developed an effective offensive doctrine for the use of nerve agents, which fully integrated CW into fire support plans. Both nerve and blister agents were used successfully in the final offensives that defeated the Iranians in 1988. These weapons were targeted specifically against command and control facilities, artillery positions and logistics areas.

Biological Weapons

LETHALITY OF BIOLOGICAL WEAPONS

Experimental data indicate botulinum toxin is about 3 million times more potent than the nerve agent Sarin. A Scud missile warhead filled with botulinum could contaminate an area of 3,700 square kilometers (based on ideal weather conditions and an effective dispersal mechanism), or 16 times greater than the same warhead filled with Sarin. By the time symptoms occur, treatment has little chance of success. Rapid field detection methods for biological warfare agents do not exist. Although botulinum can debilitate in a few hours and kill in a little as 12, and anthrax takes two to four days to kill, anthrax is more persistent and can contaminate a much larger area using the same delivery means.

By the time of the invasion of Kuwait, Iraq had developed biological weapons. Its advanced and aggressive biological warfare program was the most extensive in

the Arab world. Although Baghdad stated in 1991 it was in compliance with the 1972 Biological and Toxin Weapons Convention, the program probably began in the late 1970s and concentrated on development of two agents – botulinum toxin and anthrax bacteria. (United Nations inspection teams were later to find evidence of these two toxins, as well as clostridium perfringens.) Large scale production of these agents began in 1989 at four facilities near Baghdad. Delivery means for biological agents ranged from simple aerial bombs and artillery rockets to surface-to-surface missiles.

Nuclear Devices Program

By 1990, Saddam had made the development of a nuclear device a high priority project. The Iraqi nuclear research program had reached the initial stages of producing enriched uranium. Iraqi scientists were involved in the design, engineering and nonnuclear testing required to ensure the viability of a nuclear device. The Iraqis had pursued at least five techniques for enriching uranium; their efforts using electromagnetic isotope separation had progressed the furthest. The program still required foreign technology and equipment; Iraq's covert procurement network had obtained much of it.

In March 1990, a joint US-British sting operation prevented the illegal export of US-built nuclear device-triggering components by Iraqi front companies and Iraqi Airways. In July 1990, the Defense Technology Security Administration discovered that US-built skull induction furnaces (needed for melting and casting of metals such as uranium, plutonium, and titanium) were destined for the Iraqi nuclear devices program. Further research revealed that similar British-made furnaces were also on order for the same research program. Both US and British shipments were halted.

Iraq did not have a nuclear device at the time of its invasion of Kuwait, although it may have been able to assemble one or two crude nuclear explosive devices within six months to one year, using the uranium in the French- and Soviet- supplied reactor fuel. Although information on Iraqi nuclear devices development was limited at the time of crisis, the conflict and resulting UN Special Commission inspections will provide greater details on the scope and progress of the program.

Other Military Research and Development Programs

On 5 December 1989, Iraq launched an indigenously designed prototype experimental space launch vehicle, the Al-'Abid. Although this vehicle was a crude attempt at space launch technology, it was an impressive achievement. In September 1988, the Israelis had placed a satellite in orbit; Saddam was eager to demonstrate his nation's technological achievements. The Al-'Abid appeared to

have three stages; the first were engines in an indigenously built airframe. The second and third stages were inert, but needed for weight and aerodynamics. In wide-scale press and television coverage of the launch, Saddam claimed his engineers also had developed a 2,000-km range ballistic missile (the Tammuz, or July) using similar technology.

In March 1990, British Customs seized parts for a "Super Gun," called Project Babylon by the Iraqis. This 1,000-mm diameter bore weapon was designed to fire a gun-launched guided rocket with conventional, chemical or nuclear warheads hundreds of miles. Although the full-size weapon never was assembled (its components were destroyed after the war under UN auspices), a 350-mm research prototype had been fired at a site about 120 miles north of Baghdad.

CONCLUSION

It was this military machine that threatened the almost defenseless state of Kuwait on 1 August. Despite the numerous efforts of Arab and international diplomats and organizations, the Iraqi leader continued to rattle his saber against another Arab state. When the Kuwaiti Amir did not acquiesce to his demands, Saddam ordered his forces to attack. The resulting invasion shocked and outraged the world.

CHAPTER II

THE RESPONSE TO AGGRESSION

"If history teaches us anything, it is that we must resist aggression or it will destroy our freedoms."

President George Bush
8 August 1990



US RESPONSE- DRAWING A LINE

On 2 August, President Bush condemned the invasion, stating the seizure of Kuwait and potential Iraqi domination of Saudi Arabia through intimidation or invasion presented a real threat to US national interests, requiring a decisive response. The President immediately froze all Iraqi and Kuwaiti financial assets in the United States to prevent Iraq from gaining access to this wealth. On 5 August, after consultations with allies, President Bush characterized the invasion as "naked aggression" and stated "this shall not stand." The President decisively framed US national policy objectives:

- immediate, complete, and unconditional withdrawal of all Iraqi forces from Kuwait;
- restoration of Kuwait's legitimate government;
- security and stability of Saudi Arabia and the Persian Gulf; and
- safety and protection of the lives of American citizens abroad.

US military reaction to the invasion was immediate. Within one hour of the start of the 2 August attack, the Department of Defense (DOD) ordered the *USS Independence* (CV 62) battle group to move from near Diego Garcia in the Indian Ocean to the Gulf of Oman. The *USS Dwight D. Eisenhower* (CVN 69) battle group was ordered to sail to the eastern Mediterranean Sea in preparation for entering the Red Sea. Two Air Force KC-135 tanker aircraft in the United Arab Emirates (UAE) since 23 July were ordered to remain in the area. These aircraft were supporting UAE combat air patrols over its oil facilities in response to Saddam's accusations on 17 July.

On 5 August, three days after the invasion of Kuwait, the President dispatched the Secretary of Defense to consult with King Fahd of Saudi Arabia. The Secretary was accompanied by the Under Secretary of Defense for Policy, the Commander-in-Chief, US Central Command, and his Army and Air Force component commanders. Meeting with the King on 6 August, the Secretary reiterated President Bush's pledge of support for the Kingdom's security and stability and briefed the Saudi monarch on the US assessment of the situation. The world's premier oil-producing region – Saudi Arabia's Eastern Province – was within the easy reach of Saddam's army. Iraqi forces poised on the Saudi border had the ability, with little or no warning, to launch an armored thrust into the oil fields, move down the coast, and close Saudi Arabia's Gulf ports. Such a move would have threatened the Kingdom's survival, and would have allowed Saddam to control an additional 20 percent of the world's oil reserves, in addition to the 20 percent he controlled already in Iraq and Kuwait. Iraqi control of Saudi Arabia's Gulf ports also would have made any military operations to recapture the seized territory extremely difficult and costly. Whether Saddam actually planned to invade Saudi Arabia is unknown, but the ominous presence of overwhelming military force at the Kingdom's northern border, coupled with the fresh evidence of his willingness to attack his neighbors, constituted a threat to the vital interests of both Saudi Arabia and the United States. If Saddam's conquest of

Kuwait were not reversed, he would have been in a position to intimidate all the countries of the Arabian Peninsula. Moreover, no effort to compel Iraq to withdraw from Kuwait could succeed if Saudi Arabia remained vulnerable to Iraqi attack.

The Secretary of Defense underscored the US willingness to provide the forces needed to defend Saudi Arabia, and emphasized US forces would leave the Kingdom when the job was done. In response, King Fahd invited the United States to send forces. President Bush immediately ordered DOD to begin deployments. (A detailed discussion of US force deployments is in Chapter III, with supporting information in Appendix E.)

INITIAL WORLD RESPONSE

The international coalition that opposed Saddam's wrongful invasion was put together almost as swiftly, largely through the President's decisive leadership that focused the international consensus against the aggression and galvanized the nations of the world to act promptly and forcefully. The United States played a leading role not only in opposing the invasion, but also in bringing together and maintaining this unprecedented effort.

From the outset of the Gulf crisis, it was clear that American leadership was needed. The United States was willing to assume the leading role both politically and militarily, but did not want to be alone. America's allies and friends understood that. They joined the United States in the United Nations. They joined American forces in the Gulf with soldiers, planes, ships, and equipment. They provided financial assistance to front-line states and helped with the United States' incremental costs. What was accomplished in terms of responsibility sharing was unprecedented.

Nearly 50 countries made a contribution. Among those, 38 countries deployed air, sea, or ground forces. Together, they committed more than 200,000 troops, more than 60 warships, 750 aircraft, and 1,200 tanks. They came from all parts of the world, including Arab and Islamic countries. Their troops fought side by side with American forces. They faced danger and mourned casualties as did the United States. But they remained firmly committed to the Coalition.

Many countries contributed financially. They gave billions in cash to the United States, and provided valuable in-kind assistance, including construction equipment, computers, heavy equipment transporters, chemical detection vehicles, food, fuel, water, airlift, and sealift. They also gave billions in economic aid to countries most affected by the crisis.

Perhaps most remarkable was the amount of support provided by Coalition members to cover US incremental costs for the war. The contributions of US allies would rank, by a considerable margin, as the world's third largest defense budget,

after that of the United States and the former Soviet Union. Few would have imagined this level of participation. US allies provided \$54 billion against the estimated \$61 billion of incremental costs. Roughly two-thirds of these commitments were from the Gulf states directly threatened by Iraq, with the other one-third largely coming from Japan and Germany.

Not only was unprecedented financial support forthcoming from friends and allies as the Coalition confronted Saddam's aggression, but the governments also worked effectively in common cause against the aggression. The diplomats coordinated positions together at the United Nations, the combat forces planned and fought effectively together, and the logisticians worked quickly and efficiently to transport needed items to the Gulf. This cooperation greatly contributed to the decisive victory over Iraqi aggression. It is not possible to detail here the responses of every nation that stood against Iraqi aggression; many are described throughout this report. As an introduction, this section briefly surveys some of these many cooperative acts. (Detailed information about financial contributions is in Appendix P, with amplifying information in Appendices F and I.)

International Organizations

The United Nations played an active and important role. The nearly unanimous manner in which the UN Security Council (UNSC) and the UN membership as a whole responded during this crisis was unprecedented. Operations Desert Shield and Desert Storm were conducted in accordance with UNSC resolutions and Iraq's refusal to abide by them. On 2 August, the UNSC passed Resolution 660, condemning the invasion as a violation of the UN Charter and demanding Iraqi withdrawal. The resolution passed 14-0, with Yemen abstaining. Four days later, the UNSC passed Resolution 661, imposing a trade and financial embargo on Iraq and establishing a special sanctions committee. This measure passed 13-0, with Cuba and Yemen abstaining. After these and nine subsequent resolutions failed to end the Iraqi occupation, on 29 November the UNSC authorized members to use "all means necessary" to enforce previous resolutions if Iraq did not leave Kuwait by 15 January. (All applicable UNSC Resolutions are in Appendix B.)

The Arab League convened an emergency summit in Cairo one week after the invasion. The summit passed a resolution calling for Iraq to withdraw from Kuwaiti territory. The membership voted 12 for (Egypt, Saudi Arabia, Kuwait, Morocco, Qatar, Bahrain, Somalia, Lebanon, Oman, UAE, Syria, and Djibouti); three against (Iraq, Libya, and Palestine); two abstaining (Yemen and Algeria); three expressing reservations (Jordan, Sudan, and Mauritania); and one absence (Tunisia). The meeting was marked by heated rhetoric among the Iraqi, Saudi and Kuwaiti delegations.

Western Reaction

US allies in Western Europe responded immediately. In the United Kingdom (UK), the prime minister froze all Iraqi and Kuwaiti assets. On 6 August, two additional Royal Navy frigates were ordered to join the single British warship keeping station in the Persian Gulf. This flotilla's purpose was to show resolve and to help enforce sanctions. Two days later, after a request by King Fahd, the UK announced the start of what would be a major deployment of air and naval units as part of the multinational command forming against Iraq.

Also acting quickly, France sent an additional frigate on 6 August to augment two French warships already in the Gulf. Three days later, the French president announced he would commit ground units and advisers to Saudi Arabia although, in keeping with past policy decisions, they would not subordinate their forces formally to a multinational defense command. Initial French ground forces, code named *Force Daguet*, deployed to Hafr Al-Batin, near the convergence of the Saudi, Iraqi and Kuwaiti borders.

Italy, Spain and Germany declared that deploying American forces could use their air and naval bases. Greece later pledged this same support. This access was to become invaluable when the United States moved the VII Corps from Germany to Saudi Arabia late in 1990. Germany, whose constitution is interpreted to prohibit contribution of forces outside of the North Atlantic Treaty Organization, became a major logistic and financial supporter of the Coalition effort. On 10 August, the Canadian prime minister announced he would dispatch three ships – two destroyers and a supply ship – to the Persian Gulf.

Turkey played a crucial role in early opposition to the Iraqi invasion. Before the crisis, about half of Iraqi oil exports had passed through Turkey. Turkey's decision to shut down the Iraqi pipeline to the port of Ceyhan was vital in eliminating Iraq's ability to export oil and, combined with Saudi Arabia's closure of the Iraqi Pipeline Saudi Arabia, contributed substantially to Iraq's economic isolation.

Turkish military preparedness forced Iraq to maintain a sizable force on its northern border. Several squadrons of Turkish Air Force fighters and more than 50,000 troops were deployed to bases near the Iraqi border. On 12 August, the Turkish National Assembly gave the government power to declare war. This grant of authority was an indication of how seriously Turkey viewed the invasion. Ultimately, Turkey authorized the stationing of Coalition forces on its soil for operations against Iraq.

Although it was not a Coalition member, the Soviet Union's reaction was a key element in the success of the overall effort. Had the Soviet government chosen to oppose UN efforts, building a consensus would have been more difficult. Instead, on 2 August, the Soviets also demanded an immediate withdrawal of Iraqi troops from Kuwait. The Soviet government issued a statement that the Iraqi invasion of Kuwait

"totally contradicts the interests of Arab states, creates new additional obstacles to the settlement of conflicts in the Middle East, and runs counter to the positive tendencies in improvement in international life."

In Eastern Europe, former Warsaw Pact members and Yugoslavia all supported the UN actions against Iraq – including the use of force – despite a substantial economic burden posed by compliance with UN sanctions. All of the Eastern European governments were Iraq's creditors and lost substantial amounts of money as a result of unpaid Iraqi debts and blocked exports. Poland, Czechoslovakia, Hungary, Romania, and Bulgaria responded to Iraq's invasion of Kuwait with a willingness to commit noncombatant military units or humanitarian assistance to support the defense of Saudi Arabia. Many of these states granted overflight rights for aircraft carrying troops and materiel to the Gulf. Eventually, Czechoslovakia deployed a chemical defense unit to Saudi Arabia. Poland dispatched a medical ship, and an additional 100 medical personnel to Saudi military hospitals. Hungary provided a 37-man medical team that was attached to Saudi forces.

Asian Reaction

Japan, heavily dependent on Middle East oil – it imports 12 percent of its annual needs from Iraq and Kuwait – denounced the invasion as unlawful and a rejection of the UN Charter. Japan's constitution, written in the aftermath of World War II, allows maintenance of forces only to defend its own territory – interpreted as proscribing deployments abroad. As a compromise, the Japanese prime minister announced a six-point plan, which allowed Japan to make available civilian ships and airplanes, but restricted the cargo to food, medicine, and other noncombatant items. Japan also agreed to pay for chartering aircraft and ships from foreign countries. An initial grant of \$1 billion was earmarked immediately for the multinational forces in Saudi Arabia. Financial assistance was pledged for refugee relief as well, and to nations suffering economically as a result of adhering to the sanctions, specifically Jordan, Turkey, and Egypt.

The Chinese premier stated his government's opposition to Iraq's invasion and annexation of Kuwait. He further stated that China opposed any military intervention by world powers, believing that Gulf and Arab affairs were best handled by Gulf and Arab nations, or by the United Nations. On 5 August, the Chinese announced they would end arms deliveries to Iraq. China supported all but one UNSC resolutions concerning the Iraqi invasion of Kuwait; it abstained on Resolution 678 authorizing use of all necessary means to enforce other UNSC resolutions. In addition, on grounds that the use of force was premature at that time, China insisted on deletion of the phrase "using the minimum degree of military force" from the text of UNSC Resolution 665, which called for the enforcement of sanctions against Iraq.

REGIONAL RESPONSE

Coalition Members in the Region

The Gulf Cooperation Council (GCC) – Saudi Arabia, Bahrain, Qatar, the UAE, Oman, and Kuwait – formed in 1981 as a reaction to the Iran-Iraq war, reacted strongly. Kuwait's ambassador to the United States requested US military assistance as Iraqi troops crossed the border on 2 August. As American and other forces began to deploy to Saudi Arabia, other GCC states committed forces, offered increased access to bases, and provided logistic assistance. These contributions of the GCC states, often attended by direct risks of Iraqi reprisals, proved important to the overall effort.

Egypt played a particularly important role. Egyptian denunciation of the Iraqi invasion of Kuwait was strong and immediate. When the invasion of Kuwait occurred, the Egyptian president had been trying to defuse the crisis. Reportedly, Saddam had assured him only a few days before 2 August that Iraq would not resort to military force to resolve differences with Kuwait. He regarded the action as a breach of faith between fellow Arab leaders and the Arab Cooperation Council members (Egypt, Iraq, Jordan, and Yemen). Egypt would become a major party in the Coalition's Arab/Islamic forces, sending more than two heavy divisions to Saudi Arabia. Also, Cairo became a center for Kuwaiti exiles; with Egyptian government support, Kuwaiti television, radio, and print media continued to report from Cairo on the crisis to its citizens throughout the Middle East and Europe.

Relations between Baghdad and Cairo had been tense for some time. As many as 800,000 Egyptians had been working in Iraq during the Iran-Iraq war. This number had been reduced forcibly to about 500,000 by the summer of 1990, and was a source of tension between Cairo and Baghdad. Remittances to Egypt in 1989 had totaled almost \$550 million. On 2 August, these remittances ceased, as well as the remittances from the approximately 185,000 Egyptians working in Kuwait. The Egyptian government estimated the annualized loss at \$400 million to \$600 million.

Syria, a long-time rival of neighboring Iraq, condemned the invasion of another Arab state. Demonstrations erupted in Damascus, both in support of the Kuwaiti ruling family, and against Western intervention. The Syrians joined other regional states opposing Iraq and pledged deployment of a special forces regiment to Saudi Arabia. The first Syrian troops arrived in Saudi Arabia in mid-August, at the request of the Saudi government. Syria also moved two army divisions closer to its largely undefended border with Iraq. In October, Damascus began deployment of its 9th Armored Division to Saudi Arabia.

Morocco's King Hassan deployed troops to defend Saudi Arabia. Although other Arab Maghreb Union member states (Libya, Tunisia, Algeria and Mauritania are Morocco's partners) did not support the Iraqi invasion, they spoke out against foreign intervention and did not join the Coalition.

EGYPTIAN SUPPORT: PRESIDENTIAL LEADERSHIP

"We worked closely with the Egyptians and President Mubarak. President Mubarak and King Fahd were really the two very strong leaders in the Arab world that we worked with throughout this period.

"President Mubarak, on that very first weekend [after Iraq's invasion of Kuwait], was the first official I briefed after I talked with King Fahd and had gotten President Bush's approval to deploy the [US] force. I stopped, landed in Cairo, and then flew down to Alexandria in a small little twin engine prop plane that the US Army keeps at our embassy over there, and landed right next to the Iraqi jet that was carrying the Iraqi Vice President who was making the rounds and trying to drum up support for the Iraqi position and justify their action of having invaded Kuwait. I had to wait to get in to see President Mubarak, as he was seeing the Iraqis first. We did not meet coming in. They kept me in a building across the street to avoid a diplomatic confrontation.

"But I went in to see President Mubarak and told him what we were doing. He, of course, had been talking with President Bush. One of the things that's characteristic throughout the whole crisis is the President working the phones. Every place I went, he had greased the skids, so to speak, in front of me, which was enormously helpful, building on his personal relationships. I told President Mubarak we were going to deploy forces. He, at that point, had decided he wanted to convene the Arab League in Cairo, which was vital, which he did a few days later.

"I asked him for a number of things – overflight rights, because we had a lot of aircraft coming from the United States that would have to overfly Egypt to get to Saudi Arabia – which he readily agreed to. I also asked permission to pass one of our aircraft carriers through the Suez Canal. The carrier was the Eisenhower, which was deployed in the Med, and we wanted to immediately move it down to the Red Sea just off the Saudi coast and provide air cover in case Saddam Hussein did make a move south. President Mubarak said when do you want to move the carrier? I said tonight. He said okay, and immediately signed up for it."

Secretary of Defense Dick Cheney
December 1991

Other Regional Responses

Iran condemned the Iraqi invasion of Kuwait, but immediately declared its neutrality. For the last decade, Iran had demanded the withdrawal of foreign forces from the Gulf, especially US naval assets represented by ships of the Joint Task Force, Middle East. After the American commitment to deploy troops to the area, Iran labeled the move as "impudent" and called it a pretext to establish permanent military bases in the area. Nevertheless, it also called on the United Nations to respond to Saddam's aggression.

Nations in the multinational Coalition were very concerned about possible agreements between Tehran and Baghdad that would allow Iraq to import weapons through Iranian ports in violation of UN sanctions. Concern was heightened by Saddam's sudden reversal of his position regarding sovereignty of the Shatt Al-'Arab. In a surprise move, he accepted the *thalweg* (the center of the navigational channel) as the sovereign boundary between the two countries. He further withdrew all Iraqi forces from Iranian territory seized in the 1988 offensives. In essence, he gave up all he had won in eight years of war with Iran. Although there was smuggling of food, there is no evidence that Iran allowed weapons, munitions, or military materiel to cross the border.

During Operations Desert Shield and Desert Storm, most notably after December, Iranian smugglers were a major source of foodstuffs to Iraq, in violation of UN sanctions. The level of possible involvement of the Iranian government in these sanctions violations is not known. During Operation Desert Storm, Iraqi pilots flew more than 130 military and civilian aircraft to Iran where they remained impounded after the war.

The Hrawi government in Lebanon was the first Arab League member state to condemn Iraq's invasion of Kuwait. Apart from some pro-Iraqi demonstrations in Palestinian camps in the south, Lebanon played no direct role in the crisis.

Jordan's actions were the subject of intense international scrutiny throughout the crisis. Relations between Jordan and Iraq had been close since the beginning of the Iran-Iraq war. Because Iraq's sole outlet to the Persian Gulf was easily controlled by the Iranians in that conflict, Iraq had reached an agreement with Jordan for the use of the Red Sea port of Al-'Aqabah to import arms. The port and the associated land route into Iraq became one of the immediate focal points for maritime interception force scrutiny. An economically fragile Arab state, Jordan had received low-priced Iraqi oil, as well as increased business opportunities with Iraqi merchants, in return for Iraqi use of Al-'Aqabah.

The official level of Jordanian economic support for Iraq still is unclear. Some trade continued in violation of UN sanctions, although at a much lower level than before 2 August. The Jordanian government continued to accept Iraqi oil shipments, also technically in violation of the UN sanctions. Smuggling at an undetermined level almost certainly continued. Charitable and humanitarian groups were

permitted to send food shipments through Jordan until 16 January and Jordan was the primary exit point for hundreds of thousands of refugees leaving Iraq and Kuwait.

Some Arabs were vocal in their support of Iraqi aggression. This was especially the case with the Palestine Liberation Organization (PLO). With the exception of the Damascus-based Popular Front for the Liberation of Palestine-General Command, all PLO member organizations supported Saddam.

Two other vocal supporters of Saddam were Yemen and the Sudan. In the Yemeni capital of Sana'a, demonstrations of support for Saddam took place outside the American, British, Saudi and Egyptian embassies on 11 August. Some Yemenis volunteered to enlist in the Iraqi Popular Army, while students in Khartoum, Sudan, demonstrated in solidarity with Iraq. Support from these quarters for Saddam was more in the nature of a nuisance to the Coalition than an actual threat. However, because of long-standing border disputes between Saudi Arabia and Yemen, and between Oman and Yemen, that country's alignment with Iraq had to be treated as a potentially serious threat. A Yemeni invasion of southern Saudi Arabia or western Oman could not have succeeded; however, such a move would have diverted resources and attention away from the primary threat. Saudi Arabia remained concerned about potential threats to the kingdom's security from Sudan and Yemen throughout Operations Desert Shield and Desert Storm. Saudi concerns led to its expulsion of hundreds of thousands of Yemenis – a problem that continues in Saudi-Yemeni relations.

YEMENI AND SUDANESE VOLUNTEER TROOPS

Although Sana'a and Khartoum claimed thousands of their citizens volunteered to fight alongside Iraqi forces in the defense of Kuwait, only a few hundred probably went. Coalition forces captured some Yemenis and Sudanese during Operation Desert Storm. At the 3 March military talks at Safwan, Iraq, between senior Coalition and Iraqi officers, the Coalition provided the Iraqis an accounting of captured troops, including Yemeni and Sudanese volunteers. The senior Iraqi general disavowed any knowledge of these two groups, claiming all his forces in the KTO were Iraqis.

Israeli Reaction

On 6 August, Israel stated it was prepared to participate in any military attempt to prevent an Iraqi attack on Saudi Arabia, if asked by the United States. The Israeli prime minister warned Saddam an attack on Israel would "bring heavy

disaster on himself." Coalition leaders were worried an Israeli-Iraqi confrontation would hinder creation of an international coalition and help Iraq shift attention away from its aggression against a fellow Arab country. Throughout the crisis, the United States worked closely with Israel to encourage a "low profile" posture.

The United States took unprecedented steps to persuade Israel not to respond to the Iraqi Scud attacks and committed a significant part of its own air assets to Scud suppression efforts. A special, secure communications link established between DOD and the Israeli Ministry of Defense enabled immediate and frequent contact between senior US and Israeli officials. Near-real-time warning of Iraqi Scud missile attacks on Israel gave the Israeli populace as much as five minutes to take shelter before missile impact. In the fall of 1990, the President authorized the transfer of two Patriot air defense missile batteries to Israel, and the training of Israeli crews for their operation. After the initial Scud attacks, Israel agreed to accept four additional Patriot batteries, to be manned by US troops. Finally, the Central Command devoted a substantial amount of its air power to combat the Scud threat. The President twice sent the Deputy Secretary of State and the Under Secretary of Defense for Policy to Israel to reaffirm the US commitment to Israel's security, to ensure US objectives were clearly understood, and to coordinate the common response to the crisis.

Israel's decision to restrain its own military response denied Saddam one of his key objectives, was crucial in keeping Jordan from becoming engulfed by the war, and contributed substantially to holding the Coalition together. The increased US cooperation with Israel was, in turn, crucial to its decision to exercise restraint in the face of extreme provocation. While there never was any doubt about Israel's will to defend itself or about the capability of its professional military, it is also clear that Israeli restraint was in its own best national interests; was its best policy option; and was overwhelmingly supported by the Israeli public, senior leadership, and strategic policy makers. Israel's extraordinary restraint, however, not only was in its best interests, but also in the best interests of the United States, the other Coalition members, and Jordan.

IRAQI FOLLOW-UP TO THE INVASION

Political Maneuvering

Immediately after the invasion of Kuwait, Iraq began campaigning for public support. This effort included defaming Kuwait's ruling family and portraying Iraq as the champion of anticolonialism, social justice, Arab unity, the Palestinian cause, and Islam. In an apparent move to defuse initial international condemnation of its invasion of Kuwait, Saddam announced Iraqi troops would begin pulling out of Kuwait on 6 August. In the first days following the invasion, he had justified the invasion with the fiction that Kuwaiti officers had engaged in a *coup d'état* against the Amir. These officers had "invited" Iraq to send forces to assist them. Now,

Saddam announced to the world the group that had conducted the *coup* was now in full control of Kuwait, and Iraqi troops would return to garrison.

There was a suitably staged "withdrawal" near the northern Kuwait border station at 'Abdally. This was recorded by the press and videotapes of a few tanks loaded aboard tank transporters were released for broadcast. At the same moment, however, at least four more heavy Iraqi Army divisions were deploying into Kuwait from Iraq. In addition to reinforcing Iraqi forces in Kuwait, Saddam took action on another front.

On 8 August, Iraqi media began broadcasting threats that regimes cooperating with the United States would be destabilized. The focus of these threats was Saudi Arabia and Egypt, which Saddam blamed for organizing Arab opposition to Iraq. Two days later, Iraq indicated it no longer recognized the legitimacy of the ruling family of Saudi Arabia. An extensive media disinformation campaign was begun to support this announcement. Two anti-Saudi radio stations named "Voice of Holy Mecca" and "Holy Madinah" began broadcasting programs condemning the Saudi royal family for allowing US "infidel" soldiers to defile the Islamic holy places with "alcohol, whores, and all kinds of heroin and narcotics." Public diplomacy and psychological warfare initiatives by Iraq would continue throughout the crisis.

On 12 August, Saddam stated he would not withdraw Iraqi forces from Kuwait unless all "issues of occupation" in the Middle East were resolved. He specifically called for Israel to first withdraw from the occupied West Bank and Gaza, and Syria to withdraw its military forces from Lebanon. The Iraqi leader also proposed defusing the current crisis by replacing US and Egyptian forces deployed to Saudi Arabia with UN troops.

Iraqi Atrocities

After Kuwait was firmly under Iraqi military control, Iraqi Popular Army "volunteers" began arriving in Kuwait. They were accompanied by members of the Iraqi Intelligence Service and the Directorate of Military Intelligence. The new arrivals' mission was to establish stringent control mechanisms in Kuwait City. They immediately went about their task with unbridled brutality. Kuwaiti resistance to Iraqi rule was systematically sought out and dealt with ruthlessly. The Kuwaiti Resistance fought the invaders for weeks after the Kuwaiti armed forces had been forced to evacuate the country. They continued to attack Iraqi soldiers, equipment, and facilities until the Iraqis inflicted brutal reprisals against whole neighborhoods. Even in the face of these horrible punishments, Kuwaitis continued to risk their lives to shelter innocent foreigners, including Americans.

Kuwaitis and foreigners fleeing Kuwait reported arrests and abuse on a grand scale. Influential Kuwaitis were rounded up and taken away, many to detention centers in Iraq. Iraqi intelligence and security officials combed the city, armed with lists of names of Kuwaitis who might prove troublesome to their rule. These lists were compiled by the extensive Iraqi intelligence network. As these persons were removed from the city, bus loads of Iraqi citizens began arriving to move into their homes, part of a campaign to resettle the "19th Province" with loyal Iraqi citizens.

Physical abuse and brutality were common. There are numerous reports of rapes of Kuwaiti and foreign women, often in the presence of family members. Anyone detained by Iraqi authorities was subject to torture, often resulting in death. Iraqi intelligence and security officials converted Kuwaiti schools and other public buildings to detention and interrogation centers. Summary executions were common. The Kuwaiti government estimates more than 1,000 civilians were murdered during the Iraqi occupation. Hundreds of people remain unaccounted for, and Kuwait claims more than 2,000 of its nationals still are being detained in Iraq.

All Kuwaiti citizens and residents were protected by the Geneva Conventions for the Protection of War Victims (12 August 1949). Kuwaiti armed forces members captured by Iraqi troops were entitled to treatment as prisoners of war. As an occupying power, Iraq had specific obligations to the civilian population of Kuwait. Kuwaiti resistance fighters captured by Iraqi forces were entitled to certain fundamental rights, such as protection from torture, and a regular trial for alleged offenses. All of these obligations frequently and systematically were breached throughout the seven-month Iraqi occupation. (See Appendix O for a discussion of the role of the law of war in the conflict.)

Soon after Iraqi gains in Kuwait had been consolidated, Baghdad began the organized, systematic plunder of the conquered country. In mid-August, flatbed trucks began loading shipping containers at the Ash-Shuwaykh port. Later, Iraqi ships were used to transport cargo to the Iraqi port of Umm Qasr. From there, the cargo was redistributed throughout Iraq by barge and truck. Large quantities of oil pipe sections and related materials also were shipped to Umm Qasr from Ash-Shuwaykh.

Iraqi troops broke into the Central Bank of Kuwait and removed the country's gold and currency reserves, which were transported by truck convoy to Baghdad. National museum holdings and government records also were transported to Baghdad or destroyed. Soldiers looted the gold and gem markets of the city and the homes of wealthy merchants, taking virtually anything of value. Almost all vehicles were taken by Iraqi soldiers; the more expensive vehicles were loaded onto heavy equipment transporters and taken to Iraq; many were stripped for parts to be sold on the black markets in Iraq.

After Saddam announced the annexation of Kuwait as Iraq's 19th province, Iraqi occupation officials began the relicensing of all vehicles remaining in Kuwait. The new license plates were standard Iraqi plates, with the word "Kuwait" appearing in the province identification block. Vehicle registration became a

control mechanism for the occupation authorities. Foreigners – mostly Jordanians and Palestinians – allowed to leave Kuwait by vehicle through Iraq to Iran or Jordan, were required to display the new Kuwait province license plates before leaving Iraq.

Iraqi Hostage Taking

At the time of the Iraqi invasion of Kuwait, there were an estimated 3,000 Americans living in that country, in addition to thousands of other Westerners. Less than 10 days after the 8 August announcement that it had annexed Kuwait as its 19th province, Iraqi officials began the systematic rounding up of Western and Japanese nationals in Kuwait. They were detained in hotels in Kuwait City or transported to Baghdad. Those taken to Baghdad hotels were permitted contact with their diplomatic representations. The Iraqis appear to have respected the status and immunity of diplomatic personnel in Baghdad; however, this became an issue in Kuwait. Iraqi officials informed foreign ambassadors in Kuwait City that since Kuwait no longer was a sovereign state, embassies no longer were appropriate; all diplomatic functions were to be conducted in Baghdad. A deadline was set for the embassies to close, at which time the diplomatic status of the representatives would expire. Iraqi occupation forces cut off water and electricity supplies to the embassies that refused to close and move their functions to Baghdad.

During the second week of August, the US Embassy in Baghdad received reports that Americans without diplomatic status in Iraq were to be taken to strategic installations as "human shields." There were about 500 Americans in Iraq at the time of the invasion. Many were seized during the next few days and detained at the Ar-Rashid Hotel. On 19 August, Saddam announced that as many as 10,000 Westerners would be sent to strategic sites to deter attacks. From the Ar-Rashid, these Americans and others were transported to power plants, oil production facilities and strategic military installations. On 20 August, President Bush labeled the detainees as hostages and demanded their immediate release.

Saddam's detention of Westerners for use as human shields was not limited to foreigners living in Kuwait and Iraq. More than 350 passengers on a British Airways 747 en route to India that had landed at Kuwait's international airport for a one-hour refueling stop were detained. Many, including a 10-year-old American girl traveling alone, were taken to the Ar-Rashid and Al-Mansur Melia hotels in Baghdad. The girl later was turned over to the US Embassy. On 28 August, Saddam announced that all women and children being held hostage would be allowed to leave Iraq, although the departures did not begin until 6 September.

After limited hostage releases in late October, mostly as a result of appeals to the Iraqi leader by governments and private organizations, Saddam announced on 18 November that all hostages would be freed between 25 December and 25 March if peace continued in the region. On 3 December, Iraq announced that 1,100 Soviet nationals would be allowed to return home, followed the next day by an

"HUMAN SHIELDS"

Iraqi Foreign Minister Tariq 'Aziz claimed that Baghdad had detained foreign guests as a prudent peacemaking gesture, stating, "Our people and their representatives simply want to feel safe from a US attack on Iraq."

Information Minister Latif Nusayyif Jasim, in remarks directed at President Bush's claim that foreign detainees were being mistreated, said "Iraq's guests were being provided with all the means necessary for their comfort," in keeping with Arab and Islamic traditions of hospitality. He invited relatives of the "guests" to visit them for Christmas and New Year holidays.

Despite these claims, information from released detainees indicated that hostages – those sent to strategic sites as human shields – lived in appalling conditions, including poor to inedible food, unsanitary facilities, lack of medical care, and exposure to toxic waste.

announcement of the Iraqi Revolutionary Command Council that all 3,200 Soviets in Iraq were free to leave. Although never used as human shields, the Soviets, mostly civilian contractors, had been barred from leaving the country.

It was not until 6 December that Saddam announced that all hostages would be released at once. The first hostages to be freed as part of this release left Iraq on 9 December. Many others who had been in hiding in Kuwait were repatriated as well. All detainees and hostages who wished to leave did so in the next few days.

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Chapter III

THE MILITARY OPTION—OPERATION DESERT SHIELD

"I view very seriously our determination to reverse this aggression. There are an awful lot of countries that are in total accord with what I've just said, and we will be working with them all for collective action. This will not stand. This will not stand, this aggression against Kuwait."

President Bush
5 August 1990



US NATIONAL POLICY OBJECTIVES

- Immediate, complete, and unconditional withdrawal of all Iraqi forces from Kuwait;
- Restoration of Kuwait's legitimate government;
- Security and stability of Saudi Arabia and the Persian Gulf; and
- Safety and protection of the lives of American citizens abroad.

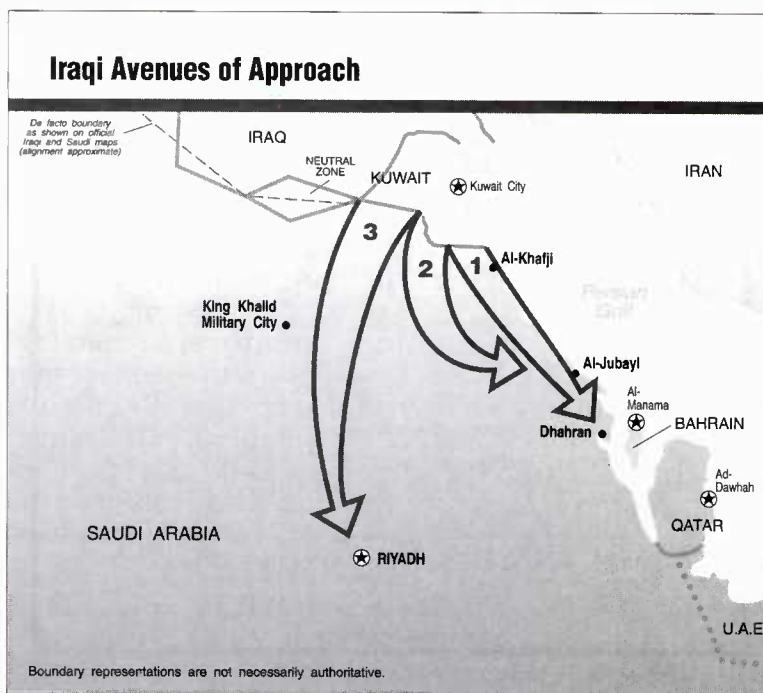
MILITARY SITUATION, AUGUST 1990

The Iraqi occupation of Kuwait was a difficult and urgent problem for US military planners. Iraqi forces, consolidating in Kuwait, appeared to be massing for possible further offensive operations into Saudi Arabia. By 6 August, the day before the first US force deployments, 11 Iraqi divisions were in or deploying to Kuwait. Far exceeding occupation requirements, Iraq had more than enough forces to launch an immediate invasion of Saudi Arabia's oil-rich Eastern Province. Intelligence reports indicated Iraqi units were being positioned along the Saudi border, while reinforcements continued to arrive in Kuwait.

If the Iraqis were contemplating an attack on Saudi Arabia, a course of action deemed possible by both the United States and Saudi Arabia in August, intelligence estimates identified three avenues of approach (Map III-1). First, the area along the Saudi coast road which runs through Al-Mish'ab, Al-Jubayl and Ad-Dammam seemed the most likely avenue, since it offered the most direct, high speed route to the port areas and coastal facilities. Although somewhat restricted by marshy salt flats, called *sabkhas*, near Al-Mish'ab, the coastal road favored armor, mechanized forces and accompanying logistics vehicles. Captured Saudi desalinization plants also would provide advancing Iraqi columns essential water. The coastal area, however, was mostly flat or gently rolling terrain that offered defenders excellent observation and fields of fire. Advancing Iraqi forces would be exposed to long-range air and ground weapons. The most defensible terrain was about 40 miles northwest of Al-Jubayl, where several low hills dominate surrounding terrain and numerous Saudi rock and limestone quarries created obstacles.

The second avenue of approach ran from central Kuwait west of Al-Wafrah, across the Saudi border to the Trans-Arabian Pipeline (Tapline) road and then southeast to the coastal road. Although it only contained a few unimproved desert roads, Iraqi forces on this avenue could bypass the *sabkhas* that restricted off-road

movement along the coast while still enabling them to seize the key coastal objectives of Al-Jubayl and possibly Ad-Dammam. Desert terrain was almost devoid of any vegetation and predominantly consisted of flat or rolling terrain, excellent for both armor maneuver and long-range defensive fires. Cover and concealment was almost nonexistent, which would expose advancing forces to air attack. Other than a small oasis village near Al-Kibrit, the area contained no water sources between Kuwait and the town of An-Nu'ariyah along the Tapline Road, which would have constrained logistically any advance of large forces.



Map III-1

A third avenue, which Coalition planners assessed to be the least likely option, led from Kuwait straight for Riyadh on unimproved roads, soft sand, and mountainous desert. Although Riyadh's capture would have given the Iraqis a decisive political and military victory, the long desert distances, extremely rough terrain, and vulnerability to air attack while in the numerous narrow passes that channelized movement, made this option impractical. North of Riyadh, the desert turned to soft sand, which would have slowed advancing armor and, more important, the truck-mounted logistics tail. Absence of water, lack of roads to move the large quantities of fuel, water, and other supplies required by an army equipped with modern weapons, probably would have overtaxed the Iraqi logistics system.

Planners and intelligence analysts viewed the coastal area north of Ad-Dammam as crucial to both an attacking Iraqi force and the Coalition defense

efforts. For the Coalition, loss of or serious damage to the port facilities at Al-Jubayl and Ad-Dammam would have made any force buildup in theater extremely difficult. For the Saudis, the loss of oil, port, water, and industrial facilities at Al-Khafji, Al-Mish'ab, Al-Manifah, Al-Jubayl, and Ras Tanurah would have been a serious economic and political blow. By seizing these areas, the Iraqis not only could have prevented a rapid Coalition military buildup, but also would have placed themselves in a politically strong position to negotiate a solution to the crisis on Baghdad's terms. They also could have achieved an important strategic victory, both in military and political terms. The mere threat of capture or destruction of these facilities by the large forces massing in Kuwait was seen as placing the Saudi government in a position that could have shifted the region's power balance substantially.

MILITARY OBJECTIVES OF OPERATION DESERT SHIELD

On the morning of 2 August, the Commander-in-Chief, Central Command (CINCCENT) briefed the Secretary of Defense, his key advisors, and the Chairman of the Joint Chiefs of Staff (CJCS) on two options for the use of military forces in response to the Iraqi invasion of Kuwait. One option involved retaliatory air strikes against targets in Iraq; the other involved deployment of air and ground forces in accordance with draft Operations Plans (OPLAN) 1002-90, Defense of the Arabian Peninsula. Two days later, at Camp David, the CJCS and CINCCENT briefed the President on available military options. CINCCENT discussed in detail the numbers and types of forces required to defend Saudi Arabia should that be necessary, estimating 17 weeks would be required to deploy all forces. The President, aware of the regional sensitivities of a large US military presence, made the decision that, if invited, the United States initially would deploy enough forces to deter further Iraqi attack, defend Saudi Arabia, and enforce UN resolutions, retaining the option to deploy more forces if needed to eject Iraq from Kuwait.

US military objectives during Operation Desert Shield were to:

- develop a defensive capability in the Gulf region to deter Saddam Hussein from further attacks;
- defend Saudi Arabia effectively if deterrence failed;
- build a militarily effective Coalition and integrate Coalition forces into operational plans; and, finally,
- enforce the economic sanctions prescribed by UNSC Resolutions 661 and 665.

These objectives provided planning staffs with the necessary direction to develop options and concepts.

A post-Vietnam survey of key military leaders who commanded relatively large forces during that conflict revealed many were, at times, unsure of the war's objectives. Those who commanded, as well as those who served, during the Gulf crisis did not suffer the same misgivings. Little confusion existed within Coalition military establishments as to what military force was expected to accomplish. Clear statements of goals helped instill confidence and eased the formulation of military objectives.

CONCEPT OF OPERATIONS – OPERATION DESERT SHIELD

While Saudi forces established a thin defensive line along the Kuwait border, initial deployment of US ground forces secured key facilities to ensure uninterrupted follow-on deployments. This placed US units in positions from which they could support Coalition forces in any defensive battle. Ports and airfields along the Gulf coast, primarily Al-Jubayl and the Dhahran complex, were chosen since they offered the best unloading facilities and were near the primary avenue of approach for an Iraqi invasion. Thus, Saddam Hussein would be forced to fight US forces on the ground soon after attacking. Both land- and carrier-based air forces provided immediate combat power able, if necessary, to inflict severe casualties on advancing Iraqi mechanized columns. They also would be able to begin a limited strategic air campaign to reduce Iraqi military capabilities and isolate Saddam Hussein. Naval forces would seal off the region, enforcing the UN embargo against Iraq.

Based on these decisions, CINCCENT developed a concept of operations and began detailed planning. The initial deployment of air, naval, and light ground forces was intended to establish combat forces in theater quickly to deter an Iraqi ground attack and defend key ports and airfields along the Saudi northern Gulf coast. As heavier ground forces arrived in Saudi Arabia, defensive dispositions were to be expanded to block the two eastern avenues of approach. Continuing arrival of armored forces would let CINCCENT counterattack any attacking Iraqi forces with a strong mechanized reserve.

The area defense concept called for establishing initial defenses near Al-Jubayl and Dhahran, and using air power to reduce substantially the combat power of attacking Iraqi forces. The idea was to rely on an enclave strategy to hold key ports and airfields or, in essence, trade space for time while US combat forces deployed to Saudi Arabia. Coalition airpower in conjunction with Saudi land forces in the forward area would bear the initial brunt of an Iraqi attack. During this initial phase, CINCCENT considered air power crucial to delaying an Iraqi attack. In early August, Central Command's (CENTCOM) Air Force planners had developed the "D-Day" air plan, with the objectives of maintaining air superiority over the Arabian

SHIFT IN SWA POLICY AND PLANS

In the fall of 1989, in the course of the Department of Defense's (DOD) regular planning process, the Under Secretary of Defense for Policy (USD(P)) recommended a shift in focus in the Persian Gulf. During most of the 1980s, security concerns in the Persian Gulf focused on the Soviet Union as the primary threat. Now, however, the USD(P) and the Commander-in-Chief, Central Command (CINCCENT) judged that this was no longer the primary threat. Instead, the disruption of the regional balance of power caused by Iraq's decisive defeat of Iran, the growing ambitions of Iraq, and the sharp disparity between its forces and those of the wealthy oil-producing nations of the Arabian Peninsula pointed to the growing possibility of regional, vice Soviet, threats to US interests in this vital region. During planning deliberations, the Secretary of Defense emphasized the importance of the Persian Gulf. Accordingly, the Secretary directed DOD to sharpen its ability to counter regional conflicts on the Arabian Peninsula. In turn, the Chairman, Joint Chiefs of Staff directed CINCCENT to develop war plans consistent with this shift.

In the Spring of 1990, Central Command (CENTCOM) re-evaluated its operations plans for the Persian Gulf region in light of the new regional strategic and military situation. A new concept outline plan was completed in late spring. The outline plan included an estimate of the forces needed to respond to a regional threat. Based on the plan, the CENTCOM staff developed draft operations plan. In July 1990, the draft plan was tested during Exercise Internal Look 90. The exercise validated tactical concepts, logistics plans, and force requirements. The lessons learned served as a basis for subsequent deployments and operations during Operation Desert Shield.

Peninsula, establishing air superiority over Kuwait and southern Iraq, and attacking Iraqi forces. Behind the Saudi units, US ground forces were considered essential to defending arrival airfields and ports. Use of the ports and airfields at Al-Jubayl and Ad-Dammam placed US ground forces in blocking positions along the anticipated direct path of any advancing Iraqi forces.

The Saudis expressed some concern with the concept of operations. Understandably, the Saudis sought to defend all their territory and population centers. CINCCENT focused on defending key areas given the limited forces available. Desiring a forward defensive strategy that would place US forces along the Kuwait border and protect all Saudi territory and population, the Saudis suggested US forces enter through the northern ports of Ras Al-Khafji and Ras Al-Mish'ab rather than further south. US planners advocated a concept of operations which would force the Iraqis to extend themselves and subject their forces to

Coalition airpower and superiority in mobile warfare. These differing views did not affect the arrival and initial positioning of US forces. The discussions of alternatives continued until November when growing force levels had substantially eased the defensive problem. An interim combined operations order was published on 20 August. Intended to ensure US commanders understood Saudi defensive plans, it authorized liaison and coordination between US and Saudi units. This close liaison between commanders characterized much of the defensive planning and operations during Operation Desert Shield.

INITIAL DEPLOYMENT OF US MILITARY FORCES

After the decision to deploy US forces, the question facing CENTCOM and Saudi planners involved the order in which forces should be deployed and how those forces should be used. Pre-crisis planning had assumed 19 days of pre-hostility deployments and nine more days of deployments after hostilities began would be available before lead enemy elements reached defensive positions near Al-Jubayl. The emerging situation indicated these assumptions were too optimistic. A credible deterrence required the early presence of substantial numbers of combat units. The same sorts of forces would be required to defend Saudi Arabia if deterrence failed. However, available sealift meant the buildup of heavy ground forces would take several weeks, if not months. The overall intent of all deterrence and defense options was to confront Iraq with the prospects of unacceptable costs and a widened conflict with the United States if it launched further attacks.

A crucial CINCCENT decision was made early in the crisis. To ensure the greatest amount of ground combat power was available as soon as possible, CINCCENT accelerated deployment of combat forces and deferred deployment of theater logistics forces. He specifically requested Air Force (USAF) A-10 units and the Army 3rd Armored Cavalry Regiment (ACR) be moved up in the deployment schedule to get more antiarmor assets into Saudi Arabia as soon as possible. As a result, many ground combat units found themselves relying on organic supplies and equipment, initial combat sustainment, host nation support (HNS), and afloat prepositioned supplies. Although many units were largely self-sufficient initially, some combat units began to experience shortages. Both the 82nd Airborne Division and the 24th Infantry Division (Mechanized) relied for a short time on HNS and on Marine Corps (USMC) forces for resupply of food and water. The theater logistics structure did not mature until mid-November. Although placing arriving units in a somewhat precarious logistics position, the decision to deploy primarily combat forces in August and September let CINCCENT place a capable defensive and deterrent force in theater rapidly during the crucial weeks when the Iraqis greatly outnumbered the Coalition.

USMC and USAF units were not as severely affected as Army units by CINCCENT's decision to deploy ground combat forces before their logistics. Marine Expeditionary Brigades (MEB) are structured and deploy as integrated air-ground-

logistics task forces. Able to draw on up to 30 days' supplies and equipment from Maritime Prepositioning Squadrons (MPS) ships, and with organic combat service support units, the MEBs proved largely self-sufficient. Arriving USAF squadrons deployed with organic aviation support packages designed to support 30 days of flight operations. Other support requirements were drawn from USAF prepositioned stocks or the host nation. Still, by C + 60, both the USAF and USMC suffered from a lack of common item support normally provided by a theater logistics structure.

The initial order to deploy combat forces to the Gulf was issued on 6 August. CENTCOM began to deploy its combat forces on 7 August, marking the beginning of Operation Desert Shield. Maritime Prepositioning Squadrons based at Diego Garcia and Guam sailed while USAF fighters and a brigade from the 82nd Airborne Division began deployment by air. (Consideration had been given to sailing MPS as early as 2 August to shorten response time and signal US intent; however, sailing orders were withheld until the President's decision to deploy air and ground forces to the region.)



Figure III-1
USS Dwight D. Eisenhower Moves Through the Suez Canal—
August, 1990

Even before Operation Desert Shield began, the United States had combat forces in the region. Two carrier battle groups with more than 100 fighter and attack aircraft, and more than 10 surface combatant ships were directed to the Gulf region on 2 August. The carrier *USS Independence* (CV 62) and her battle group sailed from near Diego Garcia to the Arabian Sea, while the *USS Dwight D. Eisenhower* (CVN 69) battle group moved to the eastern Mediterranean Sea in preparation for entering the Red Sea. In the Persian Gulf, six Navy ships, on station as part of the permanent Joint Task Force Middle East, were placed on alert and began active patrolling. Naval forces in the region soon began active operations as part of the UN embargo, beginning maritime intercept operations (MIO) in mid August, which would continue throughout the crisis. (See Chapter IV for a detailed discussion of MIO.) Two USAF KC-135s and a mobile operations center (MOC) also were operating in Abu Dhabi as part of a United Arab Emirates-requested deployment, Operation Ivory Justice. The MOC provided the only land-based secure satellite communications during the initial weeks of Operation Desert Shield. These naval and air units were, initially, the only substantial forces in theater.

Within a day of notification, USAF F-15C fighter aircraft of the 1st Tactical Fighter Wing (TFW) arrived in Saudi Arabia from Langley Air Force Base, VA. The aircraft flew non-stop for more than 14 hours, with seven aerial refuelings. By 9 August, these fighters were flying combat air patrols along the Iraq-Saudi border, supported by USAF RC-135 *Rivet Joint* reconnaissance platforms that had deployed from Europe and E-3 Airborne Warning and Control System aircraft just arrived from the United States. Also on 9 August, the first 82nd Airborne Division ready brigade troops from Fort Bragg, NC, arrived and established a defensive perimeter around the Saudi airport at Dhahran. The entire brigade was in position by 13 August; a second brigade was in place eight days later. Rapid buildup of initial forces during these crucial days would have been impossible without strategic airlift. During the first two days of the deployment, Military Airlift Command aircraft flew 91 missions into theater and averaged more than 70 missions a day for the rest of August.

US military capabilities to respond to crisis in the Gulf reflected the longstanding US commitment to the region. Since 1951, the US Military Training Mission had assisted Saudi Arabia in modernizing its military force. The Army Corps of Engineers entered into a continuous military construction program that included the Dhahran complex and King Khalid Military City. Naval forces had provided a continuous presence in the region for several decades. In the 1980s, US forces, under the newly activated Joint Task Force Middle East, protected Gulf shipping during Operation Earnest Will. Prepositioned equipment and supplies, both ashore and at sea, increased responsiveness. All these measures boosted regional confidence in the United States and eased the introduction of US forces during Operation Desert Shield.

On 11 August, Strategic Air Command B-52G bombers with full weapons loads arrived within striking range and went on immediate alert under Air Force Component, Central Command (CENTAF) control. A USAF C-130 squadron arrived in Saudi Arabia to meet intra-theater airlift requirements. On 12 August, the 101st Airborne Division (Air Assault) began to deploy by air from Fort Campbell, KY. Two days later, the 7th Marine Expeditionary Brigade from southern California, a combined arms force with tanks, helicopters, and fixed-wing attack aircraft, began unloading its MPS at Al-Jubayl. In three weeks, CINCCENT had seven brigades, three carrier battle groups, 14 tactical fighter squadrons, four tactical airlift C-130 squadrons, a strategic bomber squadron, and a Patriot air defense missile umbrella 8,000 miles from the United States.

Other Army, Navy, USAF, and USMC forces had been alerted and were en route. To manage the massive flow of personnel and equipment to the theater, many logistics arrangements had to be made. On 10 August, the first 17 Ready Reserve Fleet ships were activated; the first fast sealift ship arrived at Savannah, GA, and began loading the 24th Infantry Division (Mechanized). The first agreement to charter a US-flagged ship was signed the same day. On 11 August, the first foreign-flagged ship was chartered. However, sufficient fast sealift, able to move heavy combat units, remained a problem throughout the crisis. To improve the speed of deployment to Saudi Arabia, Phase I of the Civil Reserve Air Fleet was activated on 18 August, adding 18 passenger and 23 cargo aircraft of US commercial airlines to the effort.

On 22 August, the President signed Executive Order 12727 authorizing the Secretary of Defense, under Title 10, Section 673b of the US Code, to call to active duty selected Reserve units and individual Reservists. On 23 August, the Secretary of Defense delegated to the Service Secretaries the authority to order Selected Reserve members to active duty. Initial authorization provided for the recall of 25,000 Army, 14,500 USAF, 6,300 Navy, and 3,000 USMC Reservists. Simultaneously, the Secretary of Transportation authorized the Coast Guard to order to active duty as many as 1,250 Reservists. The first calls to active duty were announced on 24 August and, within the next few days, Army, Navy, and USAF Reservists had been notified to report.

While these mobilization and deployment actions were going on in the United States, Arab League member nations also deployed forces to Saudi Arabia. Egyptian and Syrian special forces were among the first Arab forces to arrive, augmenting Saudi and Gulf Cooperation Council (GCC) forces. It was around these initial deployments that the Coalition military force was built.

WINDOW OF VULNERABILITY

While US resolve had been demonstrated, offering a credible deterrent to an Iraqi invasion of Saudi Arabia and bolstering Coalition forces, the ability of Coalition



*Figure III-2
Armored Vehicles from the 24th Infantry Division (Mechanized) Wait to
be Loaded Aboard Fast Sealift Ships at Savannah, GA— August, 1990*

forces to defeat a determined Iraqi attack into Saudi Arabia remained questionable. CINCCENT determined this would require deployment of heavy armored and mechanized forces. However, shortages of sufficient fast sealift with a roll-on/roll-off capability so crucial to loading and unloading armored equipment rapidly meant that heavy forces would deploy incrementally. The weeks that passed until adequate heavy forces arrived in theater became known as the "window of vulnerability". Primary defense continued to rely on air power and a thin line of Saudi units along the Kuwait border, and French and Egyptian forces staging in King Khalid Military City (KKMC). To the south of these forces, XVIII Airborne Corps, commanding all Army forces, and I Marine Expeditionary Force (I MEF), in command of 7th MEB and other USMC forces arriving in theater, dug into defensive positions north and west of Al-Jubayl and in the desert outside Dhahran. Capable of putting up a stiff fight, these ground units nonetheless lacked the combat power to defeat an Iraqi attack with forces estimated at three armored and two mechanized divisions in the initial assault, supported by additional armored, mechanized, and infantry divisions.

The deployment of heavy ground forces able to conduct mobile mechanized operations was possible only through rapid sealift which, unfortunately, did not



*Figure III-3
Royal Saudi Air Force F-15 Taxis Past Arriving
US troops— August, 1990*

exist in sufficient numbers. The 82nd Airborne Division, although deployable rapidly, is primarily a light infantry division, albeit one that has substantial antiarmor capabilities with its attack helicopters. I MEF, a mechanized air-ground task force deployed by airlift and MPS shipping, provided a strong mechanized capability, but not enough strength to defeat the Iraqis. USAF, Navy, Army and USMC attack aircraft could inflict serious damage to the Iraqis, but might not be decisive against a determined Iraqi ground attack.

During this period, commanders and troops acutely felt the uncertainty of their situation. Strong indicators of Iraqi attack preparation, reported by intelligence agencies in mid and late August, led to numerous alerts and often hasty defensive preparations. USMC and Army units arriving at Al-Jubayl and Dhahran were rushed to defensive positions to protect these crucial airfields and ports. Deploying combat units fully expected to fight shortly after arrival. Some units were issued ammunition before their deployment in case they landed at Saudi airfields under attack. Living under austere conditions and manning desert outposts, the troops who arrived in these early weeks performed missions under mentally and physically exhausting conditions. Aircrews who had ferried aircraft into Saudi air bases found themselves flying patrols or on strip alert within hours after arrival. Ports and airfields were furiously cleared of arriving supplies and equipment to minimize risks of major losses should Iraq choose to attack these concentrations with missiles or attack aircraft.



Figure III-4
USAF F-15C Flies Combat Air Patrol Over Saudi Arabia—
September, 1990

US ground forces continued to flow into the theater in September and October. The 4th MEB, able to conduct an amphibious assault into the flank of an Iraqi attack, arrived in the Northern Arabian Sea on 7 September. The final 1st MEB elements arrived on 12 September, integrated into I MEF, and its ground combat

element filled out the 1st Marine Division (MARDIV). By mid-September, the 24th Infantry Division (Mechanized), with its mechanized brigades equipped with M-1 series tanks and M-2 series fighting vehicles had unloaded at Ad-Dammam. On 23 September, the final division elements arrived and moved into position alongside I MEF north and west of Al-Jubayl, establishing a line of mechanized US forces across the two most likely Iraqi avenues of approach. The 3d Armored Cavalry Regiment (ACR), just arrived from the United States, was assigned to the 24th Infantry Division. On 6 October, the rest of the 101st Airborne Division (Air Assault) arrived in Saudi Arabia, as did the European based 12th Aviation Brigade with AH-64 helicopters. Lead 1st Cavalry Division elements began arriving in early October; the division's deployment was completed by 22 October.



*Figure III-5
US Marines Conduct Chemical Defense Drill in Forward
Positions Near Al-Jubayl— September, 1990*

Substantial air reinforcements also deployed to the theater, greatly increasing CENTCOM's combat power; total combat aircraft in the region numbered nearly 1,000 by early October. Elements of the Air Force's 4th, 37th, and 48th TFWs provided a long-range, precision strike capability. Iraqi air defenses could be suppressed or eliminated by the arriving electronic countermeasures capabilities of squadrons from the 366th and 35th TFWs. Finally, aircraft crucial for ground support arrived in the form of five squadrons of F-16Cs and four of A-10s. Additionally, the 3rd Marine Aircraft Wing had both fixed wing attack aircraft and AH-1W attack helicopters to support the ground forces, as well as fighters to help maintain air

supremacy over the crucial coastal area. Carrier air wings aboard the *USS John F. Kennedy* (CV 67) and the *USS Saratoga* (CV 60), which had replaced the *USS Dwight D. Eisenhower* in the Red Sea and *USS Independence* in the Arabian Sea, respectively, added to the attack and fighter capabilities.

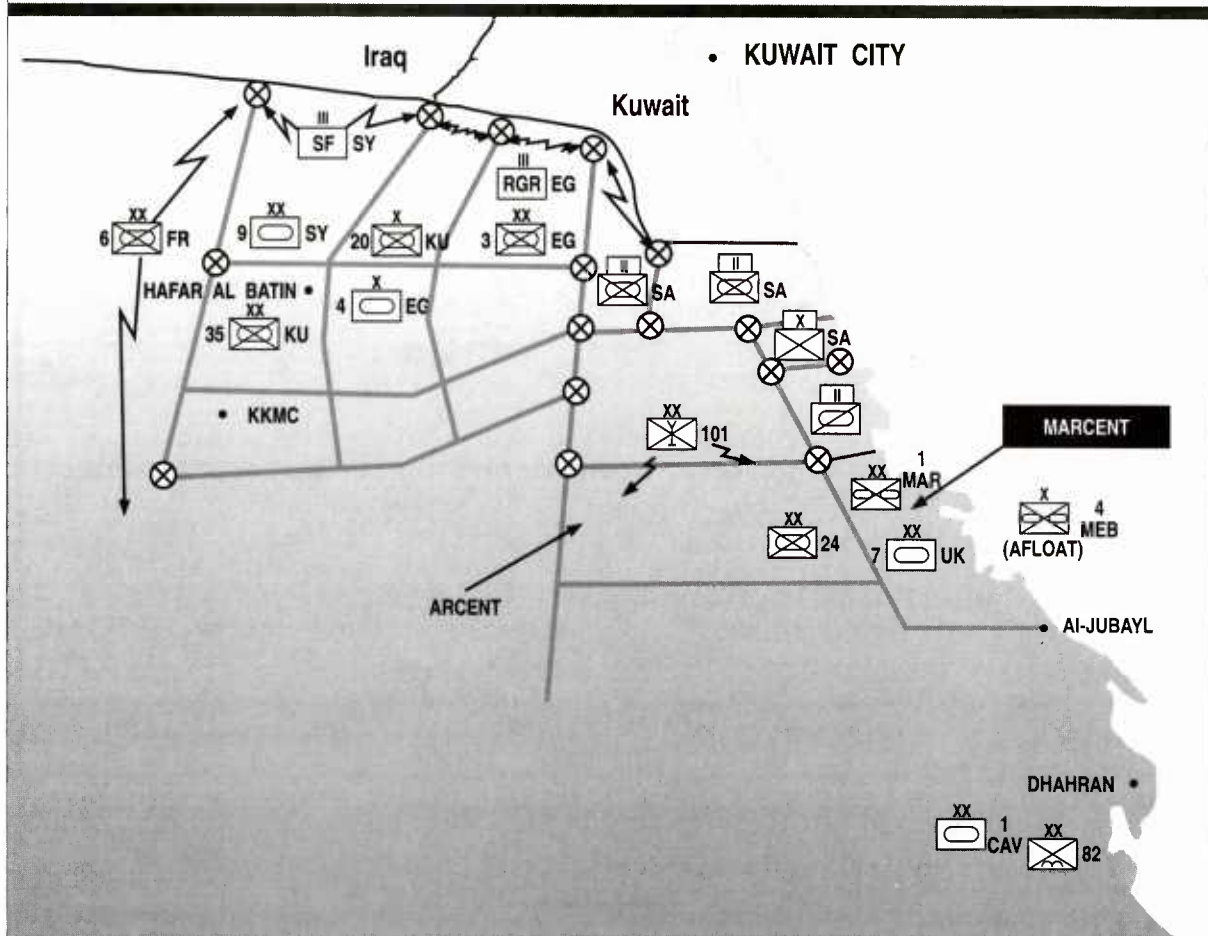
By early October, CINCCENT was satisfied the "window of vulnerability" had narrowed and that he could conduct a successful defense of Saudi Arabia. The deployment of forces essential for the defensive mission, however, had taken nearly two months.

EXPANDING THE DEFENSE

Although Iraq may have been deterred from an early attack into Saudi Arabia, it remained a potent threat, still able to attack and inflict serious military and political damage to the Coalition. Intelligence sources estimated Iraqi forces in the Kuwait Theater of Operations (KTO) in mid-October represented most of the country's combat power. By that time, 27 Iraqi divisions were deployed, including all eight Republican Guard Forces Command (RGFC) divisions. Of these 27 divisions, nine were armored or mechanized, 17 were infantry, and one was special forces. These elements were organized into the II Corps, III Corps, IV Corps and VII Corps, as well as the RGFC, which operated as a corps. Iraqi manpower in the KTO numbered more than 435,000, supported by more than 3,600 tanks, almost 2,400 armored personnel carriers, and more than 2,400 artillery pieces.

On 13 September, CINCCENT met with Lieutenant General Khalid bin Sultan bin 'Abd Al-'Aziz, Commander, Royal Saudi Air Defense Forces and operational commander of Saudi forces committed to Operation Desert Shield, to discuss future strategy for defending Saudi Arabia. Lieutenant General Khalid re-emphasized the Saudi desire for defensive strongpoints and positions to retain territory and key population areas. CINCCENT urged that the strongpoint defenses be held to a minimum and used only as a last resort, preferring a more mobile defense. He also stressed that Saudi forces might be bypassed and destroyed by advancing Iraqi forces. Finally, CINCCENT pointed out that I MEF defenses along the coast just south of the Saudi units might eliminate the need for strongpoints. As an alternative, the use of strongpoints was recommended as a temporary measure to wear down advancing Iraqi forces, with Saudi units withdrawn before they could be bypassed or overrun. CINCCENT recommended a deception plan to make the Iraqis think the Coalition's main defense was along the border. As the meeting ended, the two commanders agreed that defenses should focus on stopping the enemy north of Al-Jubayl to protect crucial facilities and cities to the south.

The agreed-upon concept of operations envisioned Coalition ground forces delaying an Iraqi attack as far forward as possible while inflicting increasing damage on the enemy, primarily through Coalition air power. In the Eastern Area Command (EAC), along the Gulf coast, defensive operations would concentrate on key cities,



Map III-2

ports, and terrain starting at the Kuwaiti border. Behind the EAC, US forces would conduct a mobile defense designed to delay and then defeat the Iraqis before they reached Al-Jubayl. In the Northern Area Command (NAC), the defense hinged on screening the border area and strongpoints at KKMC, Hafr Al-Batin, Al-Qaysumah and Hail. If attacked, NAC was to defend in sector while evacuating population centers.

Arrival of additional Coalition forces in theater let CINCCENT and the Saudis establish defenses in accordance with this concept of operations (Map III-2). CINCCENT's defensive plan positioned I MEF's 1st MARDIV along the coastal road with forward positions 70 miles north of Al-Jubayl. The Marines would fall back on successive defensive positions, until reaching a final defensive line in the quarries

and ridges 40 miles north of the port. On I MEF's left, XVIII Airborne Corps established a mobile defense in depth. The 101st Airborne Division (Air Assault) served as the Corps' covering force, forward and on the left of the 24th Infantry Division (Mechanized) which occupied the main battle area, ready to defend against an Iraqi attack along the Tapline Road and, more important, to act as a counterattack force into the flank of Iraqi forces advancing down the coast road against the Marines. To the rear, the 82nd Airborne Division assumed defensive positions in the oilfields near Abqaiq. Upon arrival, the 1st Cavalry Division, with its heavy armor, was placed in reserve, ready to counterattack Iraqi forces and drive them back into Kuwait. At sea, an amphibious task force threatened the potentially long Iraqi line of communications along the coast.

With his forces arrayed, CINCCENT intended to fight a joint and combined battle to defeat an Iraqi attack. Defensive plans relied heavily on Coalition naval and air power and night-fighting capability to balance the numerical inferiority of Coalition ground forces. Intensive coordination between Coalition units was required to ensure plans could be executed smoothly. Saudi and other Coalition units were expected to withdraw through US forces, a complicated maneuver under the best of conditions. Withdrawal routes, link-up points, fire support coordination, and many other details demanded close cooperation. Special staffs and liaison teams were established to coordinate planning. On a less formal level, units and commanders conducted regular meetings, conferences, map exercises, and rehearsals. XVIII Airborne Corps and I MEF closely coordinated their actions. In late September, a joint conference ironed out fire support and air support issues among US air, naval, and ground forces. CINCCENT conducted a map exercise on 4 October for all commanders down to division level, ensuring each understood the defensive plan and his role; lingering questions were resolved. At lower levels, informal liaison solved the immediate problems of tactical commanders. As the last elements of the XVIII Airborne Corps arrived in theater, US forces were fully integrated into defensive plans.

Forward of US defenses, Coalition forces established a thin, but gradually strengthening, line along the Kuwait and southern Iraq border. These forces were to carry out the Saudi plan of defending key areas. Politically, they served notice to the Iraqis of Coalition resolve. In the NAC sector, elements of the 6th French Light Armored Division, the initial portion of *Force Daguet*, assumed positions west of Hafr Al-Batin, screening the Coalition forces' desert flank. North of Hafr Al-Batin, a Syrian Special Forces regiment patrolled the Iraqi and former Neutral Zone border area, backed by elements of the arriving 9th Syrian Armored Division. On their right, an Egyptian Ranger battalion screened the Kuwait border east of Wadi Al-Batin in front of the 3rd Egyptian Mechanized Infantry Division. Saudi and other non-US units established additional strongpoints at Hafr Al-Batin and KKMCC. In the EAC zone, Saudi forces, consisting of a thin screen of mechanized battalions, watched over the Kuwait border between the Egyptians and the Gulf.

At CINCCENT's recommendation, the three Saudi brigades positioned along the coast were shifted to defensive positions along the border, to provide better early warning of an attack and increase the impression that Coalition defenses were

positioned well forward. As more Coalition forces arrived in November and December, they were integrated into the defensive line. These forces included a Qatari battalion, additional Egyptian and Syrian forces, the remainder of the 6th French Light Armored Division, numerous contingents from throughout the Coalition, and the growing strength of the Kuwait armed forces, which were being rebuilt at training camps near KKMC.

Throughout October, Coalition forces continued to refine defensive plans. Cross training between US and other Coalition units built mutual understanding. Coalition air forces conducted regular rehearsals of the actions they would take in an Iraqi attack. Amphibious exercises in Oman demonstrated the 4th MEB's capabilities. While the likelihood of an Iraqi attack had receded by the end of the month (CINCCENT believed it had become improbable), air, naval, and land forces continued to prepare defenses, rehearse, and, most importantly, ensure common joint and combined understanding. In late November, Exercise Imminent Thunder, a final defensive plan rehearsal, was conducted. This exercise integrated Coalition land, sea, and air forces.



Figure III-6
*Landing Craft from Amphibious Task Force Lands Marines
During Exercise Imminent Thunder— November, 1990*

The final combined defense plan for Operation Desert Shield was signed on 29 November and published in Arabic and English versions. Although supporting plans were not required from subordinate units and the OPLAN never was executed in its entirety, it confirmed actual plans and unit dispositions. While the plan also

harmonized the views of both CINCCENT and Lieutenant General Khalid, it ensured common understanding and required detailed coordination at all levels. Although events already were overcoming the need to execute the plan, it can be viewed as a model of unity of effort and combined planning in coalition warfare.

THE JOINT AND COMBINED COMMAND STRUCTURE

Command arrangements were a matter of concern to all nations contributing forces to the Coalition. Several arrangements were considered and discussed, with unity of command the underlying consideration. It became clear an acceptable command structure must reflect the participating nations' national, ethnic, and religious pride. Political factors were of exceptional importance. Eventually, a dual chain of command, one under CINCCENT and the other under the control of a Saudi commander, was developed. This structure required maximum coordination and cooperation among commanders, but did achieve a high level of unity of effort.

CINCCENT relied on a clearly defined command structure that provided him with unambiguous command of all US forces in the theater (Figure III-7). CINCCENT received his orders from the Secretary of Defense through the CJCS. CINCCENT submitted force requirements to the Secretary of Defense through the CJCS, who directed the military Services to identify and deploy those forces to the theater. As the supported commander-in-chief (CINC), he drew forces from the entire US military establishment. All forces in theater, except some specialized support units and strategic intelligence gathering assets, fell under subordinate component commanders who reported directly to CINCCENT. The Services thus provided forces to the components as directed by the Secretary of Defense through the CJCS, but held no command authority over those forces once they arrived in the theater.

Although structured along Service lines, these component commands reported directly to CINCCENT and assumed responsibility for administration, logistics, and operations of deployed forces. The Army Component, Central Command (ARCENT) commanded all Army forces in theater, other than those attached to other components. During Operation Desert Shield, these forces eventually consisted of XVIII Airborne Corps, VII Corps, and echelon above corps units providing logistics, intelligence, air defense, and other support.

The Marine Corps Component, Central Command (MARCENT) commanded all Marine forces ashore in Saudi Arabia. The tactical headquarters was I Marine Expeditionary Force, although the same person commanded both MARCENT and I MEF. Those Marines embarked aboard amphibious ships fell under Navy Component, Central Command, who commanded all US naval forces in the Gulf region, less some naval special warfare units and those Navy units assigned directly to MARCENT, such as naval construction battalions.

CENTAF commanded all USAF units in theater and also was assigned the functions of airspace control authority and Joint Force Air Component Commander, responsible for planning, coordinating, allocating, and tasking theater-wide air operations in accordance with the CINC's apportionment decisions, to include air defense.

A subunified command, Special Operations Command, Central Command (SOCCENT), retained operational command of all special operations forces (SOF) in theater, but Service component commands provided administration and logistics. While the component commands were oriented primarily along Service lines (with the exception of SOCCENT), CINCCENT was free to, and did, cross attach units to meet changing situations.

CINCCENT exercised command by allowing component commanders maximum initiative within the scope of his guidance. He directed close coordination at those levels necessary to ensure operational effectiveness and resolve problems. Component commanders coordinated directly with each other and exchanged liaison detachments. Lower level commanders who found themselves relying on other component elements did the same. This command system allowed maximum flexibility and reduced friction. More importantly, the command structure let CINCCENT maximize each component's unique capabilities, while ensuring a joint approach to operations and planning at all levels.

The Coalition command structure enabled close coordination between US and other nations' military forces. Arriving United Kingdom (UK) forces were placed under CINCCENT's operational control (OPCON), while remaining under UK command. French forces operated independently under national command and control, but coordinated closely with the Saudis and CENTCOM. Islamic forces invited to participate in military operations did so with the understanding they would operate under Saudi control. Arab ground forces were under Saudi OPCON either in the Eastern Area Command, which held responsibility for the northern coastal region of Saudi Arabia, or the Northern Area Command, which included Hafr Al-Batin, KMC and the area to the north and west. The EAC contained primarily Saudi and other GCC forces. The NAC commanded other GCC forces, as well as deployed Egyptian and Syrian units. Initially, all decisions for these forces were made by the Saudi Ministry of Defense and Aviation (MODA) Chief of Staff, a process that often proved time consuming. To streamline operational decision making, Lieutenant General Khalid was designated the Commander, Joint Forces and Theater of Operations in October, a position he held throughout the war.

To ensure close coordination between CENTCOM and forces under Saudi OPCON, an informal planning group was established in August that combined Saudi and CENTCOM military planners. The initial group included the CENTCOM Director of Plans and Policy, the MODA Director of Operations, several general officers from the Saudi armed forces, and a working group of US and Saudi field grade officers. The planning group conducted continuous coordination as forces were being rushed to the theater. It proved essential to resolving functional issues, preparing defensive plans, and arranging for ports and facilities for US forces. At lower levels, SOF teams

CENTCOM COMMAND STRUCTURE

(Mid-October 1990)

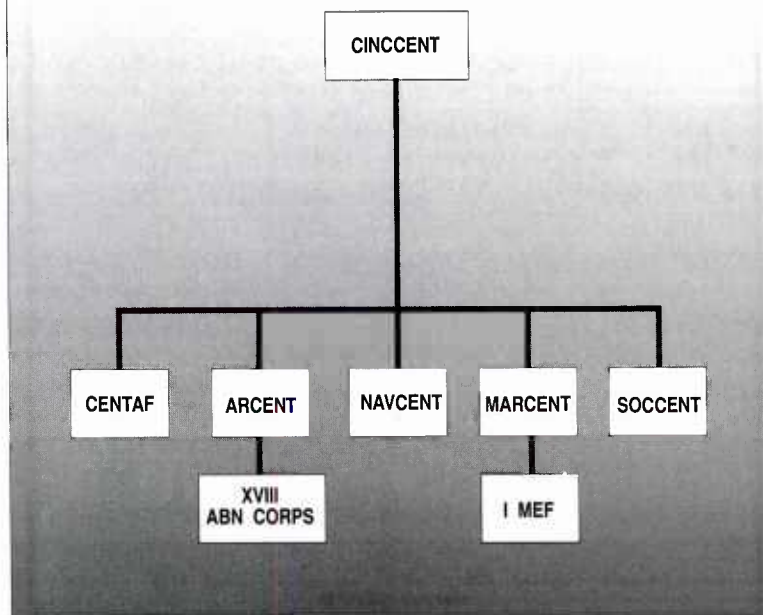


Figure III-7

were assigned to Islamic units down to the battalion level to assist with training and provide continuous liaison with US forces. These teams served with their Coalition counterparts throughout the crisis.

It quickly became clear that detailed coordination among Coalition ground forces would be necessary. In mid-August, the Coalition Coordination, Communication and Integration Center (C3IC) was formed under the ARCENT's lead. The C3IC became a clearinghouse for coordination of training areas, firing ranges, logistics, frequency management, and intelligence sharing. Manned by officers from all Coalition forces, the C3IC served as the primary tool for coordination of the myriad details inherent in combined military operations. It soon expanded and was divided into ground, air, naval, logistics, special operations, and intelligence sections. The C3IC became a vital tool in ensuring unity of effort among Coalition forces, remaining in operation throughout Operations Desert Shield and Desert Storm.

A substantial difference in experience and expertise existed between US and Saudi military planners, understandable given the size, mission, and history of the two nations' armed forces. Continuous close coordination and daily meetings were required to ensure combined plans evolved. This process was made more difficult by language and cultural differences, which placed a premium on US Arab linguists with requisite operational experience and an understanding of the region. While senior Saudi officers meticulously reviewed Arabic translations of operations plans, the few available US linguists also reviewed plans to ensure accuracy.

Arrangements for Coalition C2 reflected the political concerns of the providing nations. Parallel chains of command that enabled commanders to refer to their governments on military questions placed a premium on cooperation and military leadership. That so few issues were elevated to the national level is a tribute to these commanders' professionalism. (For detailed discussion of Coalition C2, see Appendix I.)

OBSERVATIONS

Accomplishments

- Clearly defined and articulated political objectives ensured development of equally clear military objectives and decisively contributed to the success of Operation Desert Shield.
- Forward-deployed and rapidly deployable forces let the United States quickly establish a deterrent capability in theater.
- The US military command structure was unambiguous, letting CINCCENT exercise full command over all US forces in theater, maximizing the unique service capabilities of all forces, while ensuring unity of command.
- The Coalition command structure, while having no overall commander, was successful because of close coordination and the professionalism of the personnel assigned to the staffs and units at all levels.

Shortcomings

- Lack of fully developed defensive plans between the United States and Saudi Arabia hindered initial operational planning. CENTCOM continues to conduct planning and close coordination with Gulf region nations to ensure mutual understanding.
- Initial military options were limited by the time required to move large forces into the theater. Ground force deployment depended on sufficient, dedicated, fast sealift. Sealift shortages resulted in slow buildup of heavy forces during September and October.

Issues

- Successful buildup of forces depended on the availability of sealift, the Saudi port and airfield infrastructure, and host nation support. Shortages of fast, roll-on/roll-off ships limited rapid deployment of heavy forces. The Department of Defense is addressing this issue.
- The complexities of joint military contingency planning are compounded by the requirement for rapid response, limitations on the availability of strategic lift, and operational differences among forces of a Coalition.

- Earlier MPS sailing could have provided additional military options, in terms of deterrence or rapid response, without committing US forces.

CHAPTER IV

MARITIME INTERCEPTION OPERATIONS

"Calling upon those Member States cooperating with the Government of Kuwait which are deploying maritime forces to the area to use such measures commensurate to the specific circumstance as may be necessary under the authority of the Security Council to halt all inward and outward maritime shipping in order to inspect and verify their cargoes and destinations and to ensure strict implementation of the provisions related to such shipping laid down in Resolution 661 (1990)."

United Nations Security Council Resolution 665
25 August 1990



*Figure IV-1
A Navy Helicopter Queries a Liquid Natural Gas Carrier
during Operation Desert Shield*

INTRODUCTION

The Maritime Interception Force (MIF) was the primary instrument the Coalition used to enforce the United Nations Security Council (UNSC) economic sanctions against Iraq. Sanctions require a long and concerted effort. Although

Maritime Interception Operations (MIO) continued after the cease fire, this report focuses on the period from 2 August to 28 February.

STRATEGY AND OBJECTIVES

One of the first steps the UNSC took to compel Iraq to relinquish its control of Kuwait was the imposition of economic sanctions. UNSC Resolution 661, which imposed these sanctions, was passed on 6 August. This resolution called on all States to prevent the import and export of all commodities and products to and from Iraq and Kuwait, except medical supplies and certain humanitarian shipments of foodstuffs. The resolution passed 13 to 0; Cuba and Yemen abstained. Within a few days of the Iraqi invasion, Coalition naval forces were gathering in the Red Sea and Persian Gulf. However, during the first two weeks of the crisis, the focus was on defending Saudi Arabia from a possible Iraqi invasion and building a coalition in support of Kuwait. Moreover, UNSC Resolution 661 had not authorized enforcement of the economic sanctions.

The initial Chairman, Joint Chiefs of Staff MIO alert order was dated 11 August and the Commander-in-Chief, Central Command's (CINCCENT) MIO operations order was drafted on 12 August. On 16 August, CINCCENT was directed to execute MIO, effective 17 August, consistent with the scope of the United Nations (UN) Charter's article 51, and UNSC Resolution 661. At the same time, a notice to mariners was issued to alert merchant shipping of the operation and the potential for inspections.

A multinational MIF was developed to enforce the UNSC economic sanctions against Iraq by intercepting prohibited cargo on shipping headed for or leaving Iraqi and Kuwaiti ports, or Al-'Aqabah, Jordan. Because the United Nations did not have standardized operating procedures to enforce the sanctions, CINCCENT directed Naval Forces Component, Central Command (NAVCENT) to develop an operational plan for multinational MIO, with the understanding that multinational units participating in the MIF would operate under their national commands. Initially NAVCENT directed the Commander, Middle East Force (CMEF) to plan, coordinate, and execute US MIO. CMEF drafted an operational plan for the US MIF with two primary goals:

- Effectively use available US naval forces to monitor shipping channels used by Iraq throughout the region without compromising security objectives.
- Base MIO on the most universally accepted international legal principles to enforce the sanctions with minimal interference with legitimate maritime commerce.

The operational plan considered the danger that unnecessary use of force at the early stages of the crisis might undercut international support for the sanctions or

even prompt an Iraqi military response at an inopportune time relative to Coalition building and Operation Desert Shield force deployment.

On 25 August, the UNSC authorized the use of force to enforce the sanctions and MIO began in earnest. While the use of force during MIO was justified under the UN Charter and authorized by UNSC Resolution 665, great efforts were taken to avoid not only the use of force during MIO, but also the appearance of taking any action that could be construed as the action of a belligerent during armed conflict. For example, the visit and search of suspect merchant vessels was announced to the merchant as an inspection, not a boarding. Although authorized by international law, seizure of vessels or cargoes that violated UNSC resolutions generally was not done. Instead, vessels violating the sanctions were diverted to Coalition or non-aligned Middle East ports. Additionally, careful efforts were made to minimize interference with legitimate maritime commerce to avoid adverse effects on the economies of other nations.

The Iraqi Merchant Fleet and Port Facilities

At the time of Iraq's invasion, the total Iraqi merchant fleet consisted of about 140 vessels, but only some 42 ships were suitable for overseas cargo shipment. Of these 42 ships, there were 20 tankers, three roll-on/roll-off vessels, and 19 cargo vessels of various classes.

The major ports for seaborne cargo were Umm Qasr and Khawr Az-Zubayr in Iraq, and the Jordanian port of Al-'Aqabah, from which cargo for Iraq was shipped overland. Since oil pipelines through Saudi Arabia and Turkey were shut down shortly after the invasion, the Iraqi oil terminal at Mina Al-Bakr served as the only major facility with the potential to export substantial amounts of oil.

Trade related to the Az-Zarqa free-trade zone in Jordan – much of it seaborne through Al-'Aqabah, some by air or truck – caused some confusion early in MIO. Free-trade zones are legal constructs Third World countries use to encourage industry to operate in the zone, by offering tax exemptions and other incentives. The Az-Zarqa free trade zone served as a transfer point for Iraqi-bound cargo. Initially, there was some uncertainty as to whether UNSC sanctions prohibited cargo destined for this free-trade zone. Ultimately, cargo consigned to this free trade zone was required to have an accurately documented final destination or the ships carrying it were diverted.

MULTINATIONAL RELATIONSHIPS OF THE MARITIME INTERCEPTION FORCE

The MIO's rapid development and smooth functioning was directly the product of extensive experience several of the key navies had accumulated. Importantly, during the "Tanker War" phase of the Iran-Iraq War, five European nations (members of both the Western European Union and the North Atlantic Treaty Organization (NATO)) and the United States conducted operations that protected reflagged merchant shipping in the Persian Gulf. Although these operations like Earnest Will (the name of the US effort) were separately mounted by each participating state, substantial collective experience in Persian Gulf naval operations was developed.

"Each naval force received Maritime Interception Force tasking . . . from its own national command authority. Even without a formal international command and control structure, MIF demonstrated superb international cooperation, enhanced through monthly MIF conferences. Conferences facilitated cooperation, ensured mutual protection, and reduced redundancy."

NAVCENT

After UNSC Resolutions 661 and 665 were passed, nations continued to join the effort for several weeks. By 1 September, Australia, Canada, the United Kingdom (UK), the Netherlands, and France had dispatched 20 ships to Middle East waters, but had not yet committed these forces to the MIF.

CINCCENT assigned overall MIO coordination to NAVCENT, who initiated and chaired a series of monthly coordination meetings of representatives from each participating nation. The first conference was 9 September. After the first meeting, NAVCENT delineated operating sectors for the Coalition navies who committed ships to the MIF (Figure IV-2). Each sector generally included ships from more than one country, in addition to the forces of the local Gulf Cooperation Council (GCC) States, with the understanding that the senior naval officer in each sector would be the local sector coordinator. In the Red Sea and northern Persian Gulf, the local coordinators usually were the US carrier battle group (CVBG) and destroyer squadron commanders.

By 27 September, Australia, Belgium, Canada, Denmark, France, Greece, Italy, the Netherlands, Spain, and the UK had committed 42 ships to the MIF. The GCC states participated in MIO by preventing merchant vessels from using their coastal waters to avoid the MIF. In addition to the GCC states, 13 nations (Argentina, Australia, Belgium, Canada, Denmark, France, Greece, Italy, the Netherlands, Norway, Spain, the UK, and the United States) ultimately provided ships for the MIF.

During Operations Desert Shield and Desert Storm, 22 nations participated in the MIF effort, providing support ranging from CVBGs to port logistics facilities.

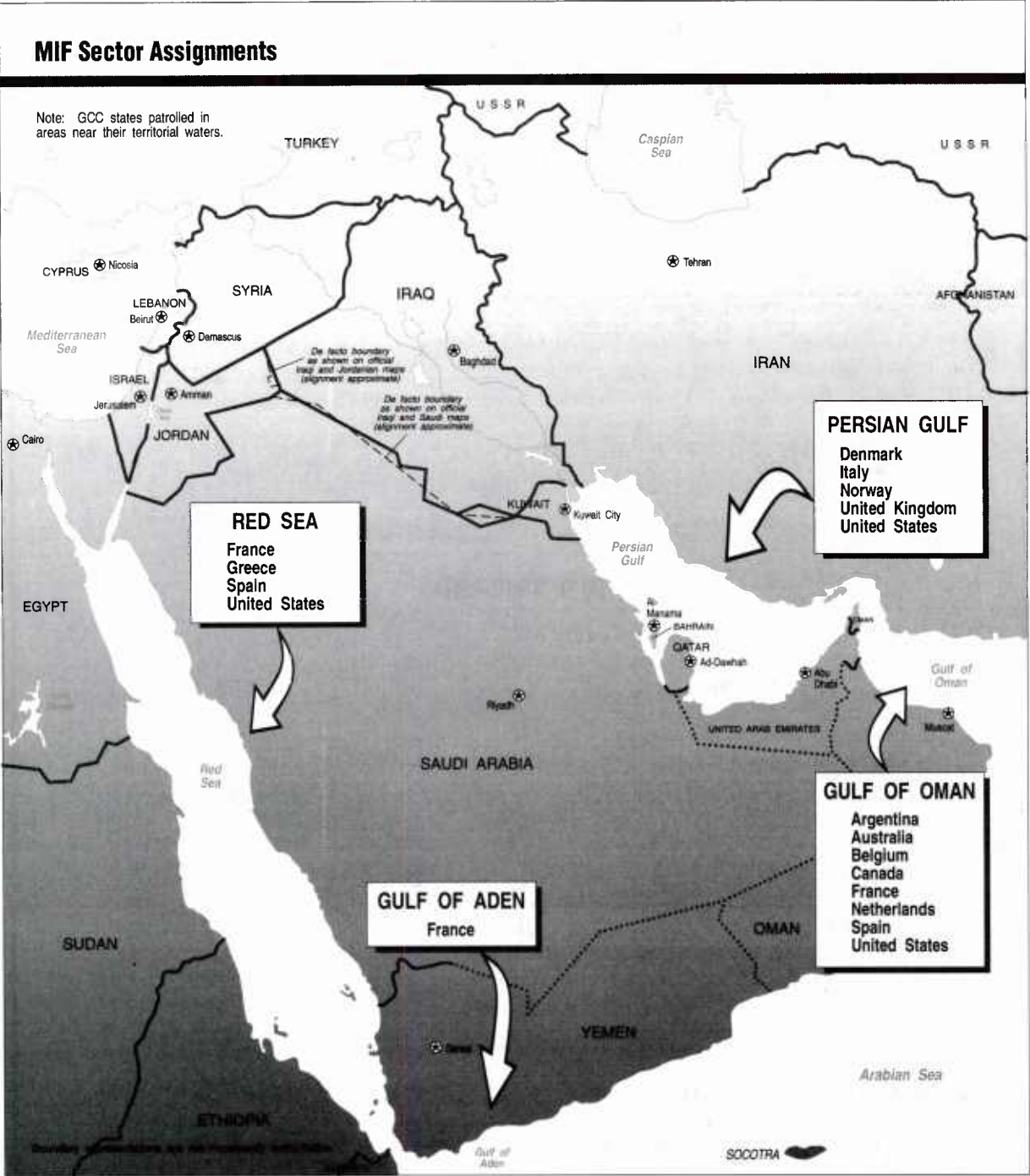


Figure IV-2

The informal, multilateral MIF command structure achieved international cooperation and superb operational effectiveness. When implementing the sanctions under the UNSC resolutions, each country operated under its own national command directives. Although operational procedures varied, coordination among the Coalition naval forces resulted in an effective multinational effort. Information on operating procedures and tactics was routinely shared among the Coalition naval forces. For example, meetings, exchanges, and briefings among Greek, French, Spanish, and US MIF participants in the Red Sea served to increase mutual understanding and standardize operating procedures. Furthermore, uniform procedures and communications methods developed during years of NATO, Australia-New Zealand-United States (ANZUS), and various bilateral exercises greatly improved the Coalition's ability to work together effectively. Diplomatic support to prevent evasion of sanctions by merchant vessels in territorial waters also was crucial to the success of MIO.



Figure IV-3
A Boarding Team from the Spanish Frigate Vencedora (F 36) Uses a Rigid-Hull Inflatable Boat to Conduct a Boarding in the Red Sea

OPERATIONAL PROCEDURES

MIO centered on surveillance of commercial shipping in the Persian Gulf, the Gulf of Oman, the Gulf of Aden, the Red Sea, and the eastern Mediterranean Sea,

supported by worldwide monitoring of ships and cargoes potentially destined for Iraq, Kuwait, or Al-'Aqabah. When merchant vessels were intercepted, they were queried to identify the vessel and its shipping information (e.g., destination, origination, registration, and cargo). Suspect vessels were boarded for visual inspection, and, if prohibited cargo were found, the merchant ship was diverted. Rarely, and only when necessary, warning shots were fired to induce a vessel to allow boarding by the inspection team. As an additional step, takedowns – the insertion of armed teams from helicopters – were used to take temporary control of uncooperative, suspect merchant vessels that refused to stop for inspection.

The Naval Operational Intelligence Center (NOIC) provided detailed technical data on numerous merchant ships. The center also developed an inspection checklist for Coalition boarding teams. As an element of the overall US contribution to UNSC Sanctions Committee deliberations, which guided the UN effort, NOIC used its resources to develop watch lists of companies suspected of trading with, or on behalf of, Iraq.

Nearly 250,000 square miles of sea lanes were patrolled by Coalition naval forces. Maritime Patrol Aircraft (MPA) such as US Navy P-3 Orions, Royal Air Force Nimrods and French Navy Atlantiques ranged over the Persian Gulf and Red Sea. During Operation Desert Shield, the combined efforts of Coalition MPA resulted in the interception of more than 6,300 ships.

Queries requesting a vessel's identity, its point of origin, destination, and cargo were issued to merchant ships by radio from warships, MPA, helicopters, or tactical aircraft flying surveillance patrols. After vessels were queried, information from imagery, radar, intelligence, shipboard computer data bases, and public shipping records were used to corroborate the responses. Some warships, like *USS J. L. Hall* (FFG 32) (the first ship to challenge a merchant vessel), averaged 10 challenges daily.

To reduce the number of unnecessary boardings, intercepted shipping could be released without boarding if the vessel signaled its intention to proceed to a port other than one in Iraq, Kuwait, or Jordan. However, any ship that failed to proceed as directed, or attempted to proceed to an Iraqi, Kuwaiti, or Jordanian port would be boarded. An exception to this policy applied to ferries and passenger liners, so long as there was no indication of subterfuge. Also, no boarding generally was required for any merchant visually confirmed to be riding high on the water (indicating the ship's holds were empty).

Two MIF warships normally conducted boarding operations. A team from one ship boarded the suspect vessel while the second ship remained nearby to provide assistance. To supplement the MIF assets, carrier-based aircraft remained on alert, prepared to launch in support of an abnormal boarding (e.g., when only one Coalition ship was available to board a suspect Iraqi-flagged merchant). Helicopters also were tasked to inspect merchant vessels. If cargo holds were open, a helicopter visually confirmed whether the vessel was empty.

Reasons for diverting a merchant vessel to a port different from its intended destination included irregularities with the ship's manifest and blatant shipment of prohibited cargo destined for Iraq or Kuwait. Manifest irregularities included improper designation of consignees on the manifests and bookkeeping discrepancies. Prohibited cargo discovered and diverted by the MIF included such items as military equipment, food, cars stolen from Kuwait, chemicals, and spare parts.

Because of their experience and expertise, United States Coast Guard (USCG) Law Enforcement Detachments (LEDETs) proved to be invaluable to MIO. Previous drug interdiction operations in the Caribbean provided LEDETs an opportunity to become familiar with Navy shipboard operating procedures, capabilities, and support assets. These operations also provided the Navy and USCG experience in conducting at-sea inspections in potentially hostile environments. LEDETs provided Navy personnel with training in boarding procedures, handling of small arms, tactics used by smugglers, and the intricacies of shipping documentation and maritime law. A USCG officer normally led a 10-person boarding team composed of three USCG enlisted specialists, one Naval officer, and five Navy enlisted personnel.

"The success of MIF operations was due in no small measure to experience and training provided by Coast Guard LEDETs."

NAVCENT

"The Coast Guard Law Enforcement Detachment hadn't been aboard but a few minutes when we realized that the Coast Guard had the corporate knowledge we needed badly."

Executive Officer, USS Goldsborough (DDG 20)

Between 18 and 31 August, three Iraqi tankers refused to allow boarding inspections after being challenged by US naval forces. On 18 August, the first MIO warning shots were fired by *USS Reid* (FFG 30) after the Iraqi tanker *Khanaqin* refused to alter course in the Persian Gulf. Even after warning shots were fired, the Iraqi vessel refused to comply with the MIF's orders to halt and eventually was allowed to proceed to Aden, Yemen, where it anchored. Boarding operations were temporarily suspended while diplomatic efforts were made to obtain UNSC authorization to use force to obtain compliance with the sanctions. UNSC Resolution 665 was approved on 25 August and boarding operations resumed the same day.

On 27 August, US MIO procedures were changed to require NAVCENT's permission before warning shots could be fired at suspected vessels. From the

beginning of MIO until 28 February, 11 interceptions required warning shots. At no time, however, was disabling gunfire used. The use of warning shots and disabling fire was tightly controlled to ensure all other means short of this display of force were used to induce compliance.



*Figure IV-4
A Maritime Interception Force Team,
Consisting of a US Coast Guard Law
Enforcement Detachment and USS W. V.
Pratt (DDG 44) Crew Members, Boards a
Merchant Vessel in the Red Sea*

US warships were authorized to use disabling fire on Iraqi merchant ships three times during MIO. Permission for disabling fire was first granted on 18 August against *Khanaqin*, but was rescinded (see *Significant MIO Events* section). CINCENT's MIO operations order was revised on 1 September to require National Command Authorities approval for disabling fire. Disabling fire was authorized again on 14 September for *Al Fao*, but its master consented to boarding before disabling force

was necessary. The last authorization was granted on 22 October against *Al Sahil Al Arabi*, which also consented to boarding before disabling fire actually was used.

"Going through the boat was probably the most stressful part because you didn't know what was behind every door. We didn't know if it was going to be a regular boarding or if someone would be waiting for us."

Boarding Team Member, USS Brewton (FF 1086)



Figure IV-5
USS Mississippi's (CGN 40) Boarding Team Conducts a Cautious Search of a Merchant Vessel in the Red Sea

Most merchant traffic the MIF queried was encountered inside the Persian Gulf (78 percent); however, most boardings occurred in the Red Sea (91 percent). Most takedowns took place against Iraqi ships in the Gulf of Oman and northern Arabian Sea. Because of concern for avoiding incidents involving infringement of territorial waters and oil spills, takedowns were purposely not conducted in the Persian Gulf. The UK was the first to conduct a takedown on 8 October, demonstrating the procedure's effectiveness.

Because of the risks involved and the potential for combat with hostile crews, takedowns were carried out by special forces using helicopter assets to insert the specially trained teams. Navy SEALs and special teams from the 4th Marine

Expeditionary Brigade (MEB) and 13th Marine Expeditionary Unit (Special Operations Capable (MEU (SOC)) carried out most Coalition takedowns. (Marine Corps (USMC) teams were not always available to the MIF because of other tasking such as the Coalition's amphibious warfare preparations.)

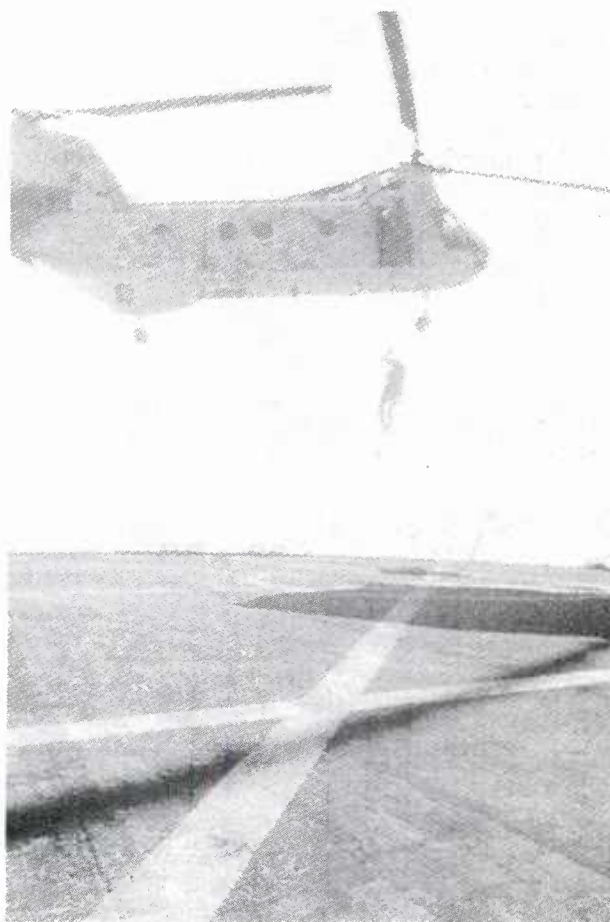


Figure IV-6
During a Training Exercise in the Red Sea,
SEALs Fast Rope from a CH-46 onto the
Deck of USNS Humphreys (TAO 188)

Since any attempt to board a ship that had refused to stop could meet with a hostile reception, Coalition naval units typically sought to muster overwhelming force against such a ship. Usually three or four warships surrounded the challenged vessel while a helicopter gunship prepared to provide covering fire. Helicopters then hovered above the ship in question, and the takedown team "fast roped" (i.e., rappelled) onto the deck. The takedown team took control of the vessel and additional forces were brought aboard, often by small boats from the surrounding coalition warships, to secure and inspect the merchant ship.

Takedowns of uncooperative vessels evolved into an intermediate step between warning shots and disabling fire. Although successful, takedowns strained available shipboard helicopter resources. There were not enough helicopters capable of inserting a full 16-member takedown team onto a vessel. Though designed primarily for antisubmarine warfare, both the SH-3 and SH-60 were adapted to meet takedown requirements. The full complement of a takedown squad usually required three SH-3s to conduct a successful insertion. The Navy's SH-60 helicopter was equipped with an M-60 machine gun and generally was used as the helicopter gunship during takedowns.

Iraq used many tactics in attempts to avoid the sanctions or frustrate the MIF. The families of Iraqi masters and crews were threatened with violence if any ship stopped for boarding. Iraqi crews often ignored verbal challenges, delayed responses to MIF interrogations, ignored warning shots, used water cannons against boarding parties, refused to cooperate after boarding, and refused to divert after verbally agreeing to do so. In most cases, the ship's master cooperated once he knew he could inform the Iraqi government he had been forced to comply. Iraqi masters sometimes labeled cargo as crew food or produced false manifests and documents. The Coalition countered these tactics by thorough searches of cargo and close scrutiny of documentation. To make it more difficult to produce fraudulent documentation, NAVCENT did not publish specific inspection criteria. In some cases, cargo was hidden in inaccessible areas of a merchant ship. Underway inspections in these situations were ineffective. With the government of Saudi Arabia's permission, suspect ships occasionally were diverted to the Saudi Red Sea port of Yanbu, where full inspections were conducted.

On 27 August, US naval forces participating in the MIF were authorized to offer safe haven to Iraqi masters and crews of vessels which refused to stop for inspection. Intercepting ships were authorized to communicate the following offer to the master of the ship: "If you fear persecution in Iraq for permitting boarding of your vessel in compliance with UN Security Council Resolutions, the United States will assist you in finding a safe haven outside Iraq." The term "safe haven" was developed to avoid confusion with existing policies concerning temporary refuge and asylum. Safe haven involved a pre-approved commitment by the State Department to protect an individual without guaranteeing asylum in the United States. No Iraqi ship master or crew requested safe haven.

SIGNIFICANT EVENTS DURING MARITIME INTERCEPTION OPERATIONS

More than 7,500 interceptions took place during Operations Desert Shield and Desert Storm, and it is not feasible to chronicle all those events in this chapter. The following descriptions, however, briefly highlight significant events that occurred.

On 18 August, the first boarding of a merchant vessel occurred when a team from *USS England* (CG 22) inspected the cargo and manifest of the Chinese freighter *Heng Chung Hai*. Later that day, the first diversion occurred when *USS Scott* (DDG 995) ordered the Cypriot merchant *Dongola* away from Al-'Aqabah after the vessel's master admitted carrying cargo bound for Iraq.

"One cannot think about this activity without mentioning the Navy – the very quiet, very professional way they put the [Maritime Interception Operations] on . . . very, very effective – maybe one of the most important things we did."

General Merrill McPeak, Chief of Staff, United States Air Force

That same day, *USS Reid* intercepted the Iraqi tanker *Khanaqin* in the Persian Gulf. The Iraqi vessel refused to comply with boarding instructions or change course. *USS Reid* fired both 25-mm and 76-mm warning shots, which also failed to induce the ship's master to comply with the boarding instructions, but did cause some of *Khanaqin*'s crew to don life jackets. *USS Reid* continued to follow the Iraqi vessel and later was relieved by *USS Goldsborough* (DDG 20). The Iraqi vessel was allowed to proceed to Aden, Yemen, where it anchored. A similar incident occurred that same day between *USS R. G. Bradley* (FFG 49) and the Iraqi merchant vessel *Baba Gurgur*. The Iraqi vessel ignored three warning shots and was allowed to proceed to Aden, where it also anchored. In late November, both crews were transferred to the Iraqi roll-on/roll-off ship *Khawla Bint Al Azwar*, ferried to Al-'Aqabah, and then returned to Iraq.

On 31 August, *USS Biddle* (CG 34) boarded the first Iraqi merchant vessel, *Al Karamah*, en route to Al-'Aqabah. A thorough inspection revealed the vessel was empty and it was allowed to proceed.

In the early morning hours of 4 September, crew members of *USS Goldsborough* and a LEDET boarded the Iraqi vessel *Zanoobia*. The Iraqi merchant had enough tea to supply the entire population of Iraq for a month and was ordered to divert to a port outside the Persian Gulf. The Iraqi merchant's master refused to divert and *USS Goldsborough* was directed to take control of the Iraqi ship. More *USS Goldsborough* crewmen were brought aboard and took *Zanoobia* to the port of Muscat, Oman, where Iraqi diplomats advised the master to return to his port of origin in Sri Lanka.

In an attempt to break down the multinational Coalition and reduce the MIF's effectiveness, Iraq, on 11 September, offered free oil to Third World countries, if they would send ships to load it. No country responded.

On 14 September, US and Australian warships conducted the first multinational boarding of an Iraqi vessel. After 24 hours of radio negotiations, the

Iraqi master of the merchant vessel, *Al Fao*, still refused to stop for inspection. The Australian Frigate *HMAS Darwin* (F 04) and *USS Brewton* (FF 1086) proceeded to the next step of the interception and fired warning shots ahead of the vessel, which caused the Iraqi vessel to slow down. The merchant vessel was boarded by a 13-member team consisting of Coast Guardsmen, *USS Brewton*, and *HMAS Darwin* crew members as *HMAS Darwin*'s helicopter provided assistance. *Al Fao* was empty and allowed to proceed to the Iraqi port of Al-Basrah.

On 27 September, *USS Montgomery* (FF 1082), with the Spanish Frigate *SNS Cazadora* (F 35), intercepted the Iraqi merchant *Tadmur* outbound from Al-'Aqabah. The Iraqi vessel did not respond to several verbal warnings to stop. Eventually, the Iraqi master informed the Coalition ships his instructions were to proceed unless stopped by force. After *USS Montgomery* fired several .50-caliber warning shots, *Tadmur* agreed to stop and permit boarding. A US and Spanish team boarded the vessel as the Iraqi crew held up pictures of Saddam Hussein. Inspection revealed the vessel was empty. The purpose of the vessel's departure from Al-'Aqabah may have been to gather intelligence on MIO procedures and to test the Coalition's resolve.

On 2 October, the French frigate *Doudart de Lagree* (F 728), intercepted the North Korean vessel, *Sam Il Po*, which was carrying plywood panels. After the merchant vessel repeatedly failed to answer bridge-to-bridge radio calls, warning shots were fired across the vessel's bow. *Sam Il Po* then stopped and permitted the French ship to board. The North Korean master claimed he was not monitoring the bridge-to-bridge radio, and that stopping would have damaged his engines. The boarding team verified the cargo and ship's destination, and allowed the ship to proceed.

The Iraqi merchant *Alwasitti* was intercepted in the Gulf of Oman on 8 October by the British frigate *HMS Battleaxe* (F 89), *HMAS Adelaide* (F 01), and *USS Reasoner* (FF 1063). All three ships fired warning shots, but *Alwasitti* refused to stop or acknowledge any communications. *HMS Battleaxe* inserted four Royal Marines by helicopter and secured the vessel, executing the first takedown of the Gulf crisis.

Also on 8 October, the Iraqi vessel *Tadmur* was intercepted again by *HMS Brazen* (F 91), *USS Goldsborough*, and *HMAS Darwin*. The Iraqi vessel informed the Coalition ships that higher authority had instructed it not to allow boarding and it refused to stop. Royal Marines from *HMS Brazen* were inserted by helicopter and *USS Goldsborough* and *HMAS Darwin* crew members boarded by small boat. The boarding team instructed the Iraqi master to divert, but he refused and instead offered to jettison his cargo at sea. *HMS Brazen*'s Commanding Officer, the local MIO coordinator, ordered the Iraqi merchant to divert to Muscat.

USS Brewton intercepted the Iraqi merchant *Almutanabbi* on 13 October, after it refused to heed verbal orders to stop. *HMAS Darwin* made a close, high speed crossing pass within 100 yards of *Almutanabbi*'s bow. Two detachments of Marines from 13th MEU (SOC), aboard *USS Ogden* (LPD 5) were inserted and rapidly gained control of the ship. The Iraqi vessel was then boarded by additional teams

from *USS Brewton*, *USS Ogden*, *HMAS Darwin*, and *HMS Jupiter* (F 60). This boarding was the first takedown by US Marines.

From 20 to 22 October, *USS O'Brien* (DD 975) intercepted and challenged the Iraqi vessel, *Al Sahil Al Arabi*, which was visually identified as a small cargo ship. The Iraqi master claimed the vessel was a fishing boat and, when boarded, it was confirmed to be a fishing refrigeration ship. However, the vessel was carrying lumber and piping, and was ordered either to divert to Bahrain or return to Iraq. The master, fearing he would be arrested if he went to Bahrain, initially agreed to return to Iraq. After the boarding party departed, the master apparently changed his mind about returning to Iraq and the crew started throwing wood over the side. When ordered to slow down, the Iraqi vessel increased speed and refused to stop.

The next day the Iraqi master again refused to turn back to Iraq, and *USS O'Brien* fired warning shots from .50-caliber, 25-mm, and 5-inch guns. Even after warning shots were fired, the vessel did not stop. On 22 October, *USS Reasoner* followed abeam of the Iraqi vessel while *HMAS Adelaide* made two close passes across the bow of *Al Sahil Al Arabi*. After the second pass, the Iraqi vessel stopped and allowed boarding. With US Marines standing by in *USS Ogden*, *HMAS Adelaide's* Commanding Officer, the local MIO coordinator, decided to insert *HMAS Adelaide's* takedown team. After the takedown, the Iraqi master cooperated fully with the team and complied with all MIF orders.

On 28 October, *USS Reasoner* intercepted the Iraqi merchant *Amuriyah*, which initially refused to answer bridge-to-bridge radio calls. *HMAS Darwin* made a close, high-speed crossing maneuver while towing a spar, which caused the Iraqi merchant to turn away and then resume its original course. In an effort to convince the vessel's master to submit to boarding, F-14s and F/A-18s from *USS Independence* (CV 62) made six low subsonic passes. The master remained extremely uncooperative and refused to accept a boarding party. *HMAS Darwin* and *USS Reasoner* fired warning shots, which only caused the Iraqi crew to don life-jackets. A 21-member USMC takedown team was inserted and initially reported no active resistance. The Iraqi master refused to muster his crew, and SEALs from *USS Ogden* were called in to help with the takedown. The crew of *Amuriyah* attempted to use a water cannon to prevent the SEALs from boarding. The crew then resisted passively as the vessel was secured; however, one crew member in the engineering spaces who tried to attack a Marine with an axe was disarmed and restrained. The ship's master also had to be restrained temporarily. Inspection revealed no prohibited cargo, so the vessel was not diverted. It appeared throughout the interception the Iraqi crew had received detailed guidance on how to avoid the sanctions and hamper Coalition boarding operations.

On 13 December, *USS Mississippi* (CGN 40) intercepted and boarded the Cypriot-flagged merchant vessel *Tilia*, outbound from Al-'Aqabah with motor vehicles and household goods. Careful inspection revealed most of the cars were stolen from Kuwait. The following day, *USS Sampson* (DDG 5) intercepted another ship with a similar load; both vessels were sent back to Al-'Aqabah.

In December, the Iraqi-flagged vessel *Ibn Khaldoon* attempted to carry food and approximately 60 peace activists to Iraq. On 26 December, *HMAS Sydney* intercepted the Iraqi ship after it refused to respond to challenges by bridge-to-bridge radio. A team of SEALs and 4th MEB Marines were inserted by USMC helicopters and met some resistance from women who formed a human chain across the vessel's midships to prevent access to the bridge. Some women also tried to grab the team's weapons and knocked one team member down. The team fired warning shots and used smoke grenades to restore order. After the takedown team gained control of the ship and slowed it down, a multinational team from *HMAS Sydney* (F 03), *USS Oldendorf* (DD 972), and *USS Fife* (DD 991) boarded the vessel. The vessel then was inspected and ordered to divert because it carried prohibited cargo (food), not authorized specifically by the UNSC as humanitarian assistance.

During the night of 27 December, a Swedish woman aboard *Ibn Khaldoon* became ill. A medical team was dispatched from *USS Trenton* (LPD 14) and the woman was treated for an apparent heart attack. The patient later was evacuated by helicopter to *USS Trenton* where she was stabilized and then transferred to a hospital in Muscat.

USS Mississippi and the Spanish frigate *SNS Infanta-Christina* (F 35) inspected the Russian merchant ship, *Dmitriy-Furmanov* on 4 January, while it was en route to Al-'Aqabah. The vessel was carrying an unmanifested cargo of tank parts, detonators and rocket launchers. On 10 January, the vessel was reboarded by *USS Mississippi* and *SNS Diana* (F 32). Inspection revealed the cargo was still unmanifested and the vessel was allowed to depart the Red Sea via the Suez Canal.

When Operation Desert Storm began, MIF boardings were stopped for one day, 17 January, to await Iraq's response to the initial attack and to allow US participants to fire Tomahawk missiles. Because of wartime conditions, NAVCENT modified his directions to the MIF to allow frequent travelers to the ports of Al-'Aqabah and Eilat to pass without boarding. Furthermore, all boardings were to be conducted in daylight, and all Iraqi ships were to be diverted automatically without boarding.

On 31 January, a Greek helicopter observed the St. Vincent-flagged cargo ship, *Superstar*, dropping what appeared to be mines in the northern Red Sea. A SEAL team from *USS John F. Kennedy* (CV 67) was inserted by helicopter and took control of the ship. Once the vessel was secured, a LEDET from *USS Biddle* boarded and inspected the vessel. The master was cooperative and provided logs and manifests. No evidence of minelaying was found.

EFFECTIVENESS

MIO appear to have been very effective. As a result of Coalition efforts during the seven months of the Persian Gulf crisis, more than 165 ships from 19 Coalition

navies challenged more than 7,500 merchant vessels, boarded 964 ships to inspect manifests and cargo holds, and diverted 51 ships carrying more than one million tons of cargo in violation of UNSC sanctions (Figure IV-7). Commerce through Iraqi and Kuwaiti ports essentially was eliminated; ships were deterred from loading Iraqi oil while Turkey and Saudi Arabia prohibited use of Iraqi oil pipelines that crossed their territory. Virtually all Iraqi oil revenues were cut off; thus the source of much of Iraq's international credit was severed, along with 95 percent of the country's total pre-invasion revenues.

By severely restricting Iraqi seaborne trade, MIO played a major role in intercepting the import of materials required to sustain military operations and operate such equipment as surface-to-air-missile systems, command and control equipment, and early warning radar systems. Importantly, access to outside sources of tanks, aircraft, munitions, and other war material to replenish combat losses effectively was precluded. Iraq did obtain some imports by smuggling along its borders, and by air, but most high-volume bulk imports were completely cut off.

Between early October and 15 January, 18 tankers and cargo ships were identified in Kuwaiti and Iraqi ports. Most of these ships transported oil or food between Iraq and Kuwait. A Maltese cargo/bulk ship also transited between various Iraqi ports. Only eight of the ships attempted to leave the Persian Gulf and subsequently were boarded; however, two ships were unaccounted for and it was not determined if they had passed through the Strait of Hormuz. The low activity level of shipping observed in Iraqi and Kuwaiti ports, coupled with reports of immobile, fully loaded tankers, verified that the flow of shipping into and out of Iraq and Kuwait had been severely curtailed.

MIO could have been streamlined and made more effective if guidance detailing the sanctions and MIO procedures could have been provided to the international maritime community. Such guidance was slow to take form, primarily because of the volatile nature of the evolving crisis and the number of changes made to procedures as MIO progressed. Also, the commanders responsible for conducting the operations were concerned that, if more details concerning procedures were made public, more creative efforts to circumvent the sanctions could be developed. This concern was particularly applicable to shipping through Al-'Aqabah.

In retrospect, detailed information might have been promulgated earlier concerning the extent of at-sea inspections, the documentation requirements, and the need to ensure cargoes were accessible for inspection. Promulgation of guidance was hindered by the lack of international standards for cargo documentation and by the absence of a readily available medium by which such information could be transmitted effectively. Without prior notice of the procedures required to satisfy the UNSC sanctions, merchantmen often were ill-prepared for required inspections. Normal practices of peacetime documentation frequently were inadequate. There were countless instances of inaccessible cargo, improper manifests, and incorrect cargo labeling, which effectively precluded manifest verification. These vessels were diverted or their movement restricted until

such problems could be remedied by rearranging cargo or by acquiring the correct documentation.

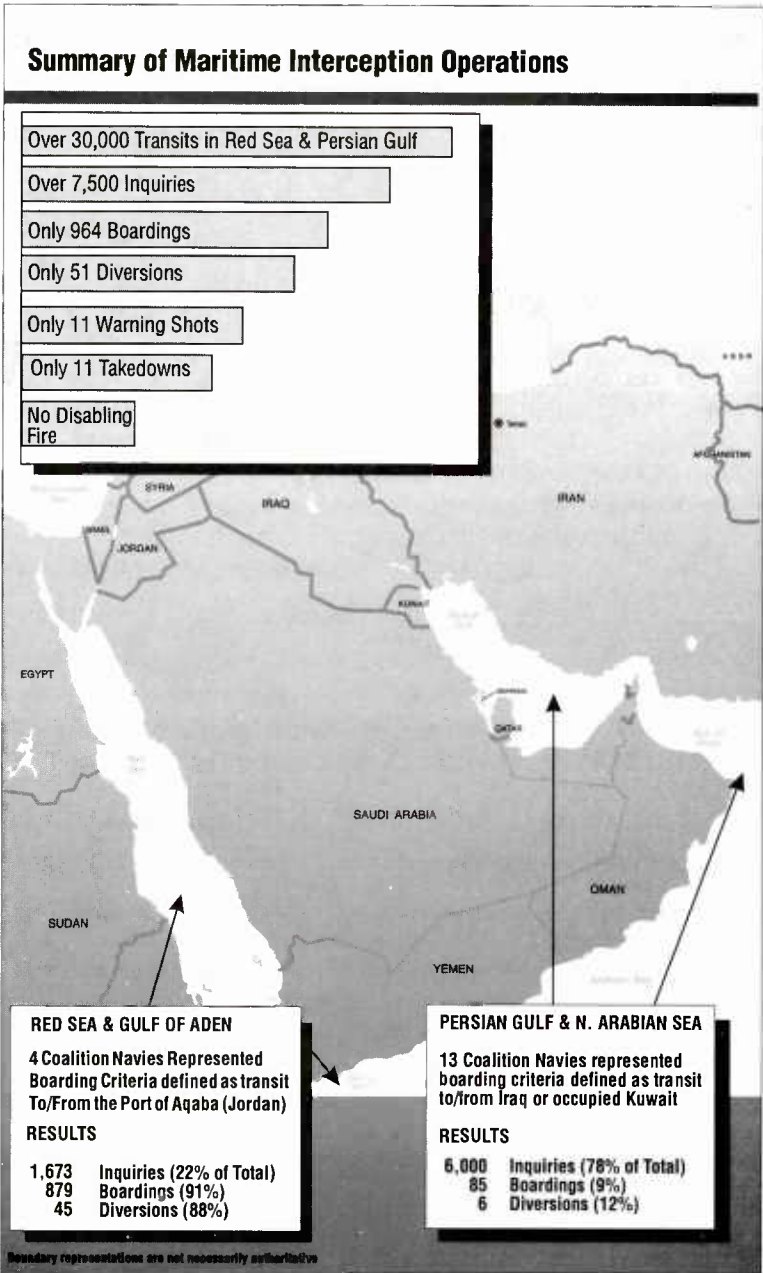


Figure IV-7

The UNSC sanctions against Iraq and the MIO that helped enforce them contributed significantly to the Coalition's victory. Although the Navy was involved in a majority of MIO, ranging from intelligence gathering and surveillance to boardings and takedowns, other Coalition navies participated in roughly half of all boardings (Figure IV-8). US ships conducted several combined boardings with Australian, British, Canadian, Greek, and Spanish warships. The MIF's multinational character built and sustained the Coalition's political and military effectiveness. Importantly, this multinational character promoted worldwide acceptance of MIO. The Coalition's procedures to enforce the UNSC sanctions were crafted in a manner least obtrusive to the rights of neutral nations and were accepted as legitimate by the majority of non-participating nations.

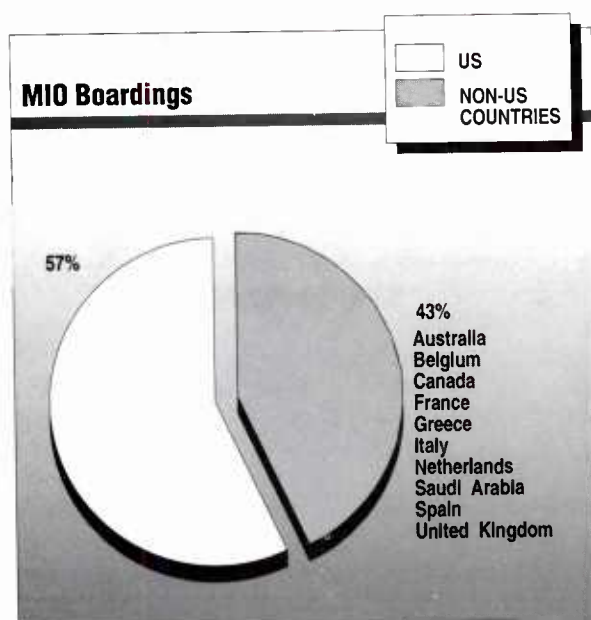


Figure IV-8

OBSERVATIONS

Accomplishments

- MIO provided a foundation for Coalition building and were an example of multinational cooperation at its best. The legitimacy of their conduct and their basis in international law were internationally accepted, which contributed to the operational success.
- International cooperation within the Coalition worked extremely well, even without formal command relationships. The uniform procedures and communications methods developed during years of NATO, ANZUS, and various bilateral exercises greatly improved the Coalition's ability to work effectively.
- Diplomatic support to prevent evasion of sanctions by suspect ships transiting territorial waters was crucial to the success of MIO. Obtaining permission to use local ports for diversions and inspections also was important.
- USCG expertise in boarding, small arms handling, maritime law, shipping documentation, and countersmuggling techniques proved to be invaluable.
- Special forces successfully executed takedowns to board uncooperative merchant ships. Takedowns became the intermediary step in MIO enforcement escalation, occurring after warning shots, but before disabling fire. They were a substantial factor in the MIF's effectiveness and success. This innovation demonstrated resolve and allowed Coalition naval forces to prevent Iraqi merchant vessels from avoiding the sanctions without taking more extreme measures such as disabling fire.

Shortcomings

- There were not enough helicopters able to insert a full takedown team onto a vessel. Three SH-3s normally were required to conduct a successful takedown. Takedowns also required a dedicated helicopter gunship to provide covering fire if the situation became hostile. The SH-60B usually was used as the helicopter gunship. These requirements strained the battle group's limited helicopter resources.

- Small boats were vital for boardings. Rigid-Hull Inflatable Boats (RHIB) or Zodiac boats, available on only a few US warships, were more effective than the Navy's standard motor whaleboats because of the RHIB's better durability, speed, and sea-keeping abilities. Generally, the weather in the Red Sea and the Persian Gulf was good, but heavy seas sometimes precluded non-RHIB small boat operations. Many Coalition forces were equipped with RHIBs and Zodiacs and could board vessels when US boat crews could not.
- Conducting MIO effectively required issuing detailed guidance to international merchantmen – guidance that often was slow to take form. Without prior notice of the procedures required to satisfy UNSC provisions, merchantmen often were ill-prepared for required inspections.
- Normal practices of peacetime shipping documentation frequently were inadequate. There were countless instances of inaccessible cargo, improper manifests, and incorrect cargo labeling, which effectively precluded manifest verification.

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CHAPTER V

TRANSITION TO THE OFFENSIVE

"The first thing for a commander in chief to determine is what he is going to do, to see if he has the means to overcome the obstacles which the enemy can oppose to him, and, when he has decided, to do all he can to surmount them."

Napoleon
Maxim LXXIX

INTRODUCTION

President Bush, speaking to the nation on 8 November, announced the United States would send more forces to the Gulf to give the Coalition a combined arms offensive capability. The President's statement marked a new phase in the crisis. Until that announcement, the United States and its allies had concentrated on deploying enough forces and materiel to deter Iraqi attack and defend Saudi Arabia from invasion. By early October, that goal had been achieved. Concurrently, the United States and several Coalition partners began discussing a wide range of military options in the event economic sanctions proved insufficient to convince Saddam Hussein to withdraw his army from Kuwait. While increasing the pressure on Saddam Hussein through further action at the United Nations and the application of sanctions, President Bush told his national security advisors in October he wanted them to develop a strong military option to force Iraq from Kuwait should that prove necessary. For the next three-and-a-half months, the Defense Department planned and prepared for offensive operations.

PLANNING FOR THE OFFENSIVE

Evolution of the Offensive Plan

Immediately after the Iraqi invasion of Kuwait, the Commander in Chief, Central Command (CINCCENT) developed several Deterrent Force Packages for consideration by the Chairman, Joint Chiefs of Staff (CJCS), Secretary of Defense, and the President. On 4 August, at a meeting in Camp David, MD, CINCCENT presented his initial ideas to the President. These Deterrent Force Packages included an array of forces which included carrier battle groups (CVBG), tactical fighter squadrons, tanker aircraft, Airborne Warning and Control System (AWACS), B-52s, Maritime

Prepositioning Force Marine Expeditionary Brigades (MPF MEB), and an airborne division.

The Secretary of Defense instructed CJCS and CINCCENT to develop an offensive option that would be available to the President in case Saddam Hussein chose to engage in further aggression or other unacceptable behavior, such as killing Kuwaiti citizens or foreign nationals in Kuwait or Iraq. On 10 August, the Air Force (USAF) deputy director of plans for warfighting concepts briefed CINCCENT in Florida. The CJCS was briefed the following day and directed the Air Staff to expand the planning group to include Navy, Army, and Marine Corps members and to proceed with detailed planning under the authority of the Joint Staff's (JS) director of operations (J3). He reviewed the concept with the Secretary of Defense and received his approval. As the plan was developed further, it continued to be reviewed in detail by the Secretary of Defense and CJCS, culminating in an intensive two-day review of the plan in Saudi Arabia in December. If all went well, air attacks would paralyze Iraqi leadership, degrade their military capabilities, and neutralize their will to fight. (For more details of early air campaign planning, see Chapter VI)

After the Camp David meetings, planning continued at Central Command (CENTCOM) headquarters. On 25 August, CINCCENT briefed the Secretary of Defense and the CJCS on a four-phase offensive campaign, designed to provide a coordinated multi-axis air, naval and ground attack beginning with Phase I, "Strategic Air Campaign" against Iraq; Phase II, "Kuwait Air Campaign" against Iraqi air forces in Kuwait; Phase III, "Ground Combat Power Attrition" to neutralize the Republican Guard and isolate the Kuwait battlefield; and Phase IV, "Ground Attack" to eject Iraqi forces from Kuwait. At this point, the plan for the ground campaign was in outline form, although no request was made for these forces at this time. CINCCENT concluded that assembling the necessary forces in theater for a ground offensive would take at least eight months. (The precise phase titles later were changed as the plan evolved.)

During the 25 August briefing, a chart portrayed CINCENT's Intent:

"We will offset the imbalance of ground combat power by using our strength against his weakness. Initially execute deception operations to focus his attention on defense and cause incorrect organization of forces. We will initially attack into the Iraqi homeland using air power to decapitate his leadership, command and control, and eliminate his ability to reinforce Iraqi forces in Kuwait and southern Iraq. We will then gain undisputed air superiority over Kuwait so that we can subsequently and selectively attack Iraqi ground forces with air power in order to reduce his combat power and destroy reinforcing units. Finally, we will fix Iraqi forces in place by feints and limited objective attacks followed by armored force penetration and exploitation to seize key lines of communication nodes, which will put us in a position to interdict resupply and remaining reinforcements from Iraq and eliminate forces in Kuwait."

The development and refinement of the plans continued to be reviewed in detail by the Secretary of Defense and CJCS, culminating in an intensive two-day review of the plan in Saudi Arabia in December.

The initial concept of operations for the ground campaign included use of only a single corps and called for a night ground attack with the objective being an area of high ground north of the Mutla Pass and Ridge, near Al-Jahra and Kuwait City, on the main line of communication (LOC) northwest of Kuwait City. (Figure V-1 highlights the general location of the objective area discussed.) The plan involved an attack north by a single corps, fighting only selected enemy forces, conducting high tempo operations, and overwhelming enemy defenses with mass rather than finesse.

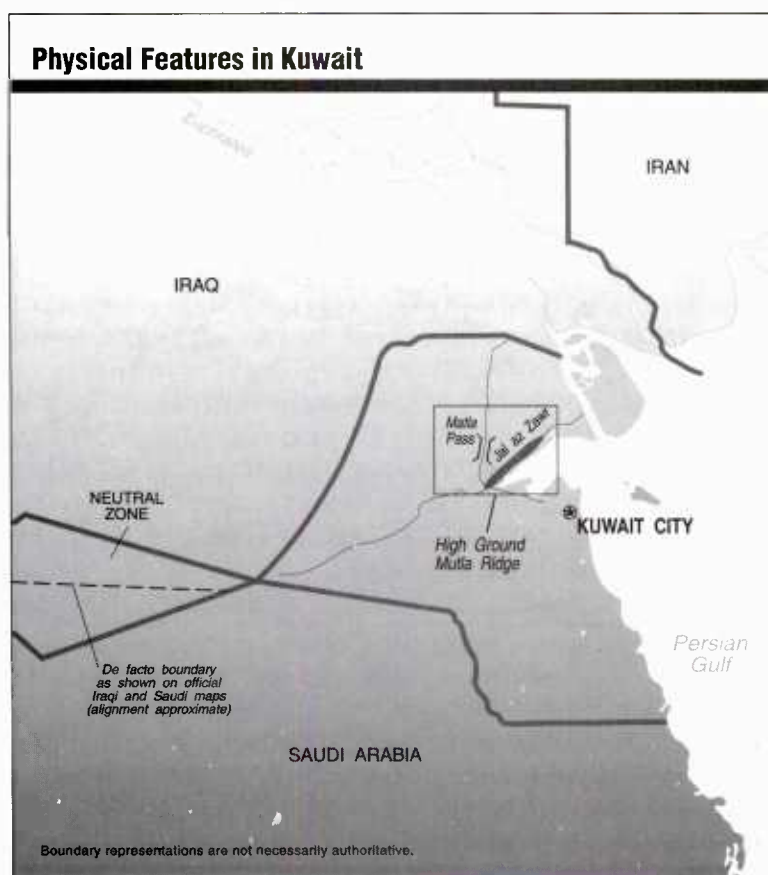


Figure V-1
Physical Features In The Kuwait Theater

On 11 October, this plan, with the single corps ground campaign, was briefed to the President, Secretary of Defense, and the CJCS, by the CENTCOM Chief of Staff who conveyed CINCCENT's assessment of the plan. Many risks were outlined, including the possibility of significant casualties; the difficulty of sustaining forces

across an extended LOC; the lack of an armor force to serve as theater reserve; and the threat that Iraqi chemical attacks would slow the pace of operations. Further, success depended on several key accomplishments: the air campaign had to produce projected attrition of combat effectiveness to ensure success on the ground; the Coalition had to overcome interoperability obstacles; and the campaign had to end quickly with capitulation of Iraqi forces to avoid a protracted war of attrition. Planning for Phases I-III was sound. However, there were strong reservations concerning Phase IV. The draft plan called for advancing through the southern Kuwait border – 60 kilometers east of the Tri-border area. A frontal attack was to be directed at the enemy's obstacle belts and defensive fortifications and forces. (Figure V-2 depicts Iraqi dispositions as of 23 October.)

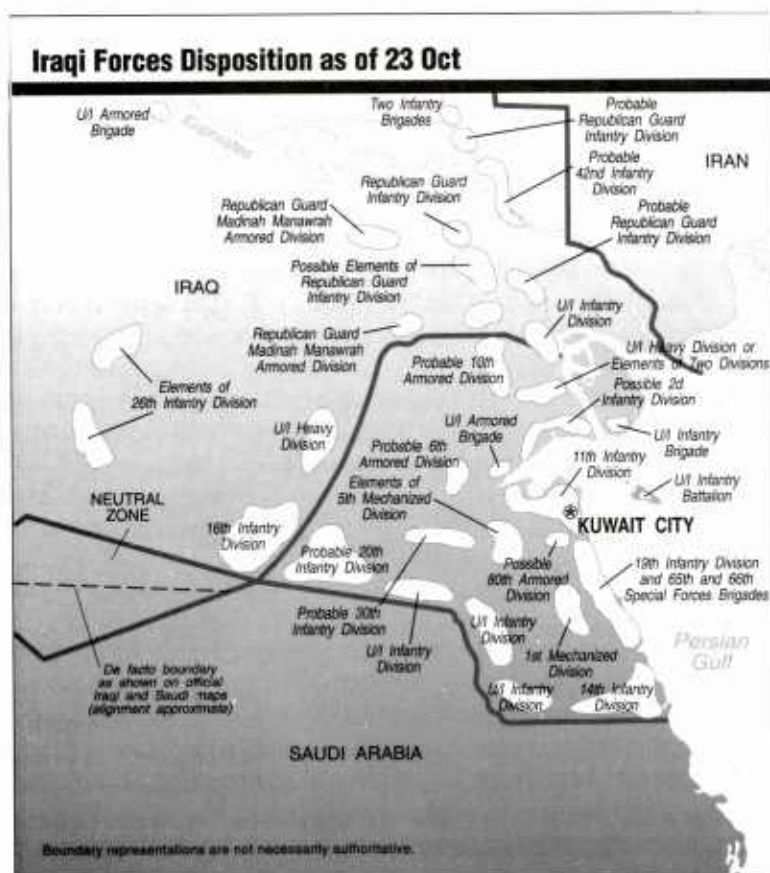


Figure V-2
Iraqi Dispositions as of 23 October

The CENTCOM briefing produced two reactions. One was a concern because the plan called for an attack into the strength of the Iraqi positions. A second

concern was that no matter what plan of attack was decided on, there was a need for more forces than were in the Kuwait Theater of Operations (KTO) at the time.

The day after the meeting with the President, the Secretary of Defense directed preparation of options for an attack on Iraqi forces through the western Iraqi desert in lieu of the riskier frontal attack. After consultation with the President, the Secretary of Defense directed CJCS to go to Saudi Arabia in order to find out from CINCCENT what he needed and to tell him that the President would be disposed to give him whatever forces he needed to do the job.

At a meeting of planners on 15 October, CINCCENT directed that the concept of the ground attack include a wider envelopment to the west. Although planning for a single corps attack would continue, CINCCENT directed consideration of a two-corps option as well. The concept of operations for the two-corps option assumed that attrition of crucial ground, air defense and command, control and communication (C3) systems would be achieved by strategic and tactical air before Phase IV began, and that Iraqi forces would use chemical weapons during the ground attack. The intent was for the air campaign to establish favorable strategic conditions, and to set the stage for the ground offensive. On 21 October, CINCCENT was briefed on the revised offensive plan. He directed that the main effort would be to destroy the RGFC.

On 22 October, the CJCS was briefed in the CENTCOM headquarters on the ground offensive. The CJCS was briefed on both a single and a two-corps attack. The advantages and disadvantages of both options were assessed. Discussion ensued concerning the advisability of using a single corps attack. CINCCENT stated that a single corps frontal attack put the force at risk because Coalition strength was insufficient to attack a force the size of Iraq's. In terms of advantages, the concept for a two-corps attack would permit: massing of Coalition forces; high tempo of operations; fighting only selected Iraqi forces; bypassing of the obstacle belt; and surprise. The disadvantages were the risk to supply lines 180 km long and the risk to the flanks of the main attack which were exposed for about 100 km. The plan sacrificed simplicity and flexibility because of the relative complexity of multiple supporting attacks and the precise timing of the attacks. Discussion ensued concerning the advisability of employing a single corps attack. As a result of the meeting, the CJCS reiterated that CINCCENT should continue planning for a two-corps attack and agreed to seek approval from the Secretary of Defense and the President for additional forces consisting of the VII Corps, the 1st Infantry Division, a Marine division, additional CVBGs, an additional amphibious MEB, and tactical fighter wings.

On 27 October, CJCS asked CINCCENT to develop a plan to conduct an attack with ground forces against Scud fixed launcher complexes at H2 and H3 airfields in the extreme western part of Iraq (H2 and H3 are designations of pumping stations along the now-defunct Iraqi pipeline that terminated at Haifa). Although CENTCOM planners considered some options, this plan later was rejected because of the extended LOC to support the operation and the risk and the demands of planned corps operations.

Campaign Planning

A campaign plan is a plan for a series of related military operations designed to accomplish a common objective, normally within a given time and space. The "Combined OPLAN for Offensive Operations to Eject Iraqi Forces from Kuwait" as finally adopted in January was a combined campaign plan jointly signed by CINCCENT and the Commander, Joint Force/Theater of Operations. It featured related air, land, sea, space and special operations. The common objectives of the plan were designed "to counter Iraqi aggression, secure Kuwait, and provide for the establishment of a legitimate government in Kuwait."

As a result of popular use of the word "campaign" when referring to air, land, and sea operations during Operation Desert Storm, confusion exists concerning how many campaigns actually were planned and conducted. Adding to the confusion are the titles used for campaign Phases I (Strategic Air Campaign) and IV (Ground Offensive Campaign) in the combined OPLAN. In fact, there was only one overall theater campaign, divided into four distinct phases: I - Strategic Air Campaign, II - Air Supremacy in the KTO, III - Battlefield Preparation, and IV - Ground Offensive Campaign. The campaign included supporting air, land, sea, space, and special operations in each phase. This joint and combined campaign was planned with close attention to joint doctrinal principles. These principles have been developed and reinforced throughout US military history, forming the central tenets of warfighting.

However, throughout Operations Desert Shield and Desert Storm, the term "campaign" frequently was used informally and generically to describe various aspects of the overall effort. For example, numerous official comments were made about the "air campaign", the "ground campaign" or the "maritime campaign". These comments appeared in various documents and media reports, to include statements by senior officials. These terms were routinely used to refer to the air, ground, and maritime forces' contributions to the theater campaign objectives.

In compiling this report, the intent has been to record, in historically accurate terms, how the conflict was conducted. As such, the term "campaign" is occasionally used in the context of references made before and during the war and to refer to contributions of a single service.

With the rejection of the plan to attack H2/H3, CENTCOM focused on the corps envelopment options. Direction was issued to expand the area of offensive operations farther to the west to a road the Iraqis had built from As Salman to the Saudi border. Guidance was given to investigate an area of operations from the

vicinity of As-Samawh to the east along Highway 8 to select suitable terrain for a battle to destroy the RGFC in the KTO. Planning assumptions now were based on the availability of: two Army corps, one USMC corps, one corps consisting of two Egyptian divisions and one Syrian division, and Arab forces consisting of Saudi and Gulf Cooperation Council (GCC) forces.

Throughout, trafficability issues played a role in planning. There was concern as to whether wheeled vehicles could negotiate the terrain north of the Saudi-Iraqi border. A secondary concern was cross-country mobility for large trucks west of the Kuwait-Iraq border. A trafficability test was conducted by XVIII Airborne Corps in the area east of Wadi Al-Batin and south of the Kuwait-Saudi border. The terrain in this location most closely resembled that west of the Wadi Al-Batin and north of the intended line of departure. Tracked and wheeled vehicles were driven cross-country to confirm the terrain could accommodate them.

CENTCOM planners met 1 November to discuss logistics requirements to support Operation Desert Storm. Sustainment in the desert for a second increment of deployments and for existing forces was a major concern. Initial force deployments in August had demonstrated it would be too difficult to receive, move, and sustain more forces in such an austere environment without first deploying additional combat service support (CSS) capabilities. (For a discussion of logistics considerations, see Appendix F). The planners decided to deploy more CSS before combat and combat support (CS) forces. The CSS forces were needed to provide support and transport forces. Contrary to the practice of marshaling units and their equipment at the ports of debarkation, the plan was to receive and push forces directly to assembly areas because the capacity of air and sea ports of debarkation would not support linkup and marshaling operations on the scale and in the time available for the second increment of forces.

On 14 November, CINCCENT conducted a commanders' conference at Dhahran to discuss offensive operations. CINCCENT explained his concept. XVIII Airborne Corps was to be used in the west in the vicinity of As Salman to As Samawah. The European-based VII Corps would be the main effort and destroy the RGFC. British forces would remain with the Marine Corps Component, Central Command (MARCENT) (a decision later reversed). A heavy division was to be assigned as the theater reserve. Supporting attacks would be conducted by the First Marine Expeditionary Force (I MEF), Joint Forces Command - North (consisting of Egyptian, Saudi, and Syrian forces) and Joint Forces Command - East (consisting of Saudi and GCC forces). Commanders were directed to have forces ready by mid-January. (Figure V-2 depicts the ground offensive concept of operations.)

Initially, the United States planned unilaterally for the offensive while simultaneously participating with the Coalition in the defense of Saudi Arabia. Coalition partners became fully involved in planning the overall offensive once the United Nations (UN) and Coalition members agreed to UN Security Council (UNSC) Resolution 678. (Discussion of Resolution 678 is in Appendix B). On 10 December, CINCCENT directed that combined planning begin on the offensive campaign. Each Coalition force had unique strengths and weaknesses which planners had to take

into account to achieve the best overall results. Saudi Arabia and Egypt, as the designated planners for Arab-Islamic forces, were then involved in the detailed planning. On 15 December, a combined warning order was issued to Coalition forces so they could begin their preparations for offensive operations.

On December 19 and 20, the plans were reviewed in detail by the Secretary of Defense and CJCS during the course of two full days of briefings at CINCCENT Headquarters in Riyadh. At the conclusion of that review, the Secretary of Defense gave his approval of the plan. On their return to Washington, he and the Chairman briefed the President, who also approved the plan. At that time, it was decided that if Saddam Hussein refused to withdraw from Kuwait and it became necessary to use force, the offensive would begin with the air campaign. While the ground campaign was approved, its start would be a separate and subsequent decision also requiring Presidential approval. Factors influencing the decision to begin the ground campaign are discussed in Chapter VIII, The Ground Offensive Campaign.

The operational imperatives outlined were:

- Achieve air superiority to allow Coalition freedom of movement and maneuver.
- Reduce to about half the combat effectiveness of Iraqi armor and mechanized forces with Coalition air assets. Of these, reduce selected brigades so the surviving unit was no larger than a battalion.
- Fight only selected Iraqi ground forces in close battle.
- Mass Coalition forces against selected Iraqi forces.
- Accept losses no greater than the equivalent of three companies per Coalition brigade.
- Achieve rapid theater tactical intelligence feedback on battlefield events.
- Use strategic deception to portray a defensive posture.
- Use operational deception to fix or divert Republican Guard and other heavy units away from main effort.
- Use tactical deception to facilitate penetration of barriers.
- Friendly LOCs must support minimum daily supply requirements.

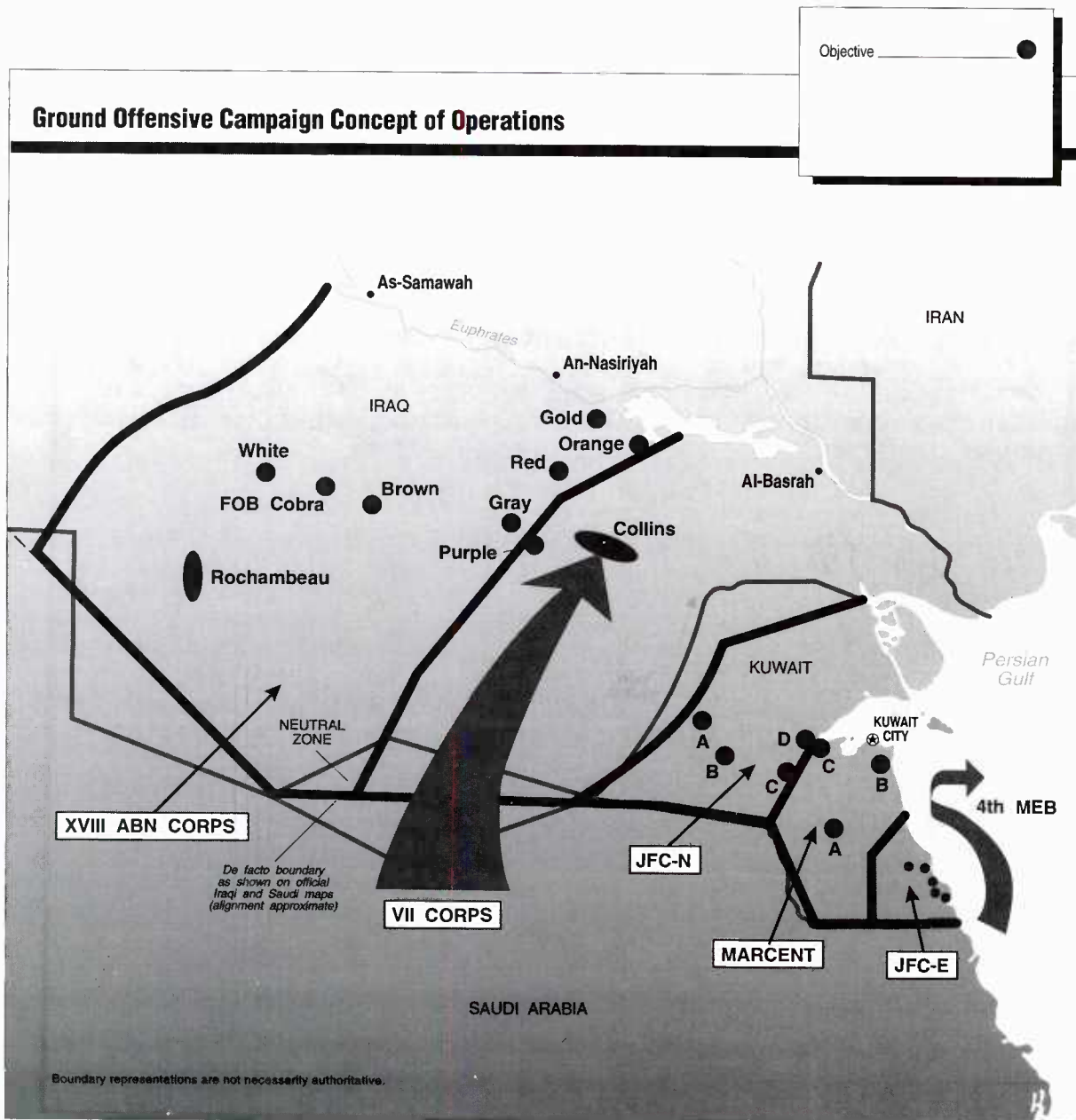


Figure V-3
Ground Offensive Campaign Concept

PRINCIPLES OF PLANNING

Decisive Force

In order to achieve assigned goals quickly and with minimum Coalition casualties, US defense planners applied the principle of decisive force. This contrasted with the incremental, attrition warfare which had characterized US operations in Vietnam. When US forces were committed to combat in Southwest Asia, planners were able to exploit every possible advantage in tactics, equipment, command and control, and the forces deployed to the theater at maximum speed. The Coalition used these advantages to conduct massive, simultaneous operations throughout the KTO and Iraq, rather than attacking centers of gravity and other crucial objectives piecemeal.

Strength Against Weakness

The overall offensive strategy was designed according to tested principles of applying strength against the enemy's weakness, while preventing him from doing the same to Coalition forces. Although the Coalition was operating in an environment seemingly more familiar to the opponent, uncertain about Saddam's Husayn's intent to use weapons of mass destruction, operating across an enormous area and with extended LOCs, and was, according to intelligence estimates, outnumbered, the Coalition nevertheless could exploit a number of distinct strengths. Among these were the high quality of Coalition air, ground, and naval forces, specifically:

- Superior personnel and training;
- Technological advantages in weaponry;
- The prospect of early and effective air superiority;
- A superior ability to acquire intelligence throughout the theater, including unimpeded access to space;
- Widespread international support; and,
- The high caliber of Coalition political and military leadership.

THE IRAQI THREAT IN OVERVIEW

A central element of military campaign planning is the estimation of enemy forces, including their strengths and weaknesses.

Intelligence Estimates

By mid-October, intelligence estimates indicated Saddam Hussein had more than 435,000 troops on the ground in Kuwait, dug in and arrayed in mutually supporting defenses in depth. These forces continued to grow, and were believed to have reached more than 500,000 by January. At least two defensive belts interspersed with formidable triangular fortifications had been established along the Saudi border with Kuwait. These defensive belts consisted of minefields and oil-filled fire trenches, covered by interlocking fields of fire from tanks, artillery, and machine gun positions. Strong, mobile, heavily armored counterattack forces, composed of the best elements of the Iraqi army, stood poised to strike at Coalition penetrations of the initial lines of defense. The Republican Guard units, augmented by army heavy divisions, served as the theater reserve and counterattack force. Equally strong positions were constructed along the sea coast, incorporating naval and land mines. Iraqi troops also fortified high rise apartment buildings fronting on the Gulf, turning them into multi-tiered fortresses.

Iraqi forces constructed an impressive system of roads, buried communications lines and supply depots. Command posts also were buried, often under 25 feet of desert soil. This infrastructure did much to multiply the combat power of an already powerful defensive force. It allowed reinforcements and supplies to move over multiple routes to any point on the battlefield. These roads, many of which were multi-lane, were so numerous that it was not feasible to destroy all of them. Buried telephone lines and fiber optic cables for command and control (C2) purposes also were very difficult to attack. In early January, stocks of supplies in Kuwait and just north of the Iraq-Kuwait border were estimated to be sufficient to last through a month or more of sustained combat without replenishment, and many of these stocks had been dispersed to make detection and destruction more difficult.

Enemy Vulnerabilities

Despite Iraq's numerical strength and extensive military infrastructure, the Coalition knew the Iraqi forces had significant weaknesses:

- A rigid, top-down C2 system and the reluctance of Iraqi commanders to exercise initiative;

- Ground forces and logistics especially vulnerable to air attack in desert conditions;
- A generally defensive approach to battle and limited ability to conduct deep offensive operations;
- An over-extended and cumbersome logistics system;
- An uneven quality of military forces, built around a limited number of Republican Guards divisions ;
- Faulty understanding of Coalition forces' operational capabilities;
- A limited ability to interfere with US space-based assets;
- A limited air offensive capability; and,
- Ineffective foreign intelligence.

Iraqi Centers of Gravity

In addition to these weaknesses, the Coalition had identified Iraq's centers of gravity. First was the command, control, and leadership of the Saddam Hussein regime. If rendered unable to direct its military forces, or to maintain a firm grip on its internal population control mechanisms, Iraq might be compelled to comply with Coalition demands. Second, degrading Iraq's weapons of mass destruction capability would reduce a major part of the threat to other regional states. This meant attacking the known Iraqi nuclear, chemical and biological (NBC) warfare production facilities along with various means of delivery – principally ballistic missiles and long-range aircraft. The third of Iraq's centers of gravity was the Republican Guard. Eliminating the Guard in the KTO as a combat force would reduce dramatically Iraq's ability to conduct a coordinated defense of Kuwait or to pose an offensive threat to the region later.

Prelude To Conflict

As the UN deadline approached, attempts to induce Saddam Hussein to withdraw from Kuwait and comply with UN resolutions continued. Late in December, the 12-member European Community (EC) called for a special session in Luxembourg in an effort to develop a solution to the crisis. On 3 January, President Bush, declaring his willingness to "go the extra mile for peace", offered to send the Secretary of State to meet with the Iraqi Foreign Minister. Such a meeting was

conducted in Geneva on 9 January to no avail, as Iraq refused to accede to UN and Coalition demands. On 12 January, the US Congress passed a Resolution supporting President Bush's decision to use force.

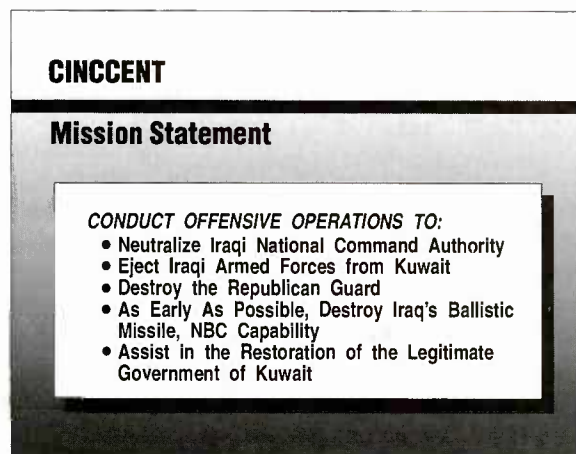
Saddam Hussein, despite repeated warnings and the demonstrated Coalition solidarity, remained defiant. He continued to reinforce his forces in the KTO, while attempting to divide the Coalition through propaganda and political maneuvering. The Iraqis repeatedly attempted to tie US and Western involvement in the crisis to Israel in an attempt to exploit Islamic sensitivities. In this, Saddam Hussein was aided to some extent by Iranian religious leaders who called for Islamic war against Western forces in the Gulf region. This attempt to create an Islamic-Western faultline sought to break up the Coalition by extracting Arab/Islamic states from it. Saddam Hussein repeatedly vowed to inflict massive casualties on US and Coalition forces should war occur – another gambit designed to disrupt the Coalition by eroding popular support. On 30 December, the ruling Ba'ath Party newspaper stated that a war with Iraq would not be confined to the Gulf, but would include a global terrorist campaign against the United States by Moslem guerrilla fighters. On 3 January, Iraq informed the foreign diplomatic corps in Baghdad the government would move all functions out of the capital in preparation for war. Inside Kuwait, harsh measures by Iraqi occupation forces reinforced Saddam Hussein's hard-line rhetoric. Indeed, reports of atrocities committed by Iraqi troops grimly attested to the cruelty of Iraqi occupation. Intelligence sources continued to report systematic looting in Kuwait City, as well as random killing and torture of Kuwait civilians. Saddam Hussein appeared committed to confronting the Coalition.

In the United States, and in many Coalition capitals, some debate continued about whether the economic sanctions and embargo should be given more time. More than \$3 billion in Iraqi assets had been frozen worldwide, and Iraqi credit had been severed, along with almost 95 percent of its pre-crisis revenue. The air and naval embargo had sealed off Iraq from the rest of the world, reducing trade to overland smuggling, mostly of foodstuffs. The primary effect of the sanctions, however, was on the civilian rather than military side of the Iraqi economy. Food was rationed, but large-scale shortages had not occurred. Manufacturing of non-essential goods was curtailed. Oil refineries continued at reduced levels, and rationing provided adequate quantities of petroleum, oil and lubricants (POL) for military operations. Although spare parts and crucial components were in short supply, leading to some cannibalization and stripping of commercial vehicles in Kuwait, most units remained combat ready.

FINALIZING THE PLAN

National Policy Objectives and Military Objectives

Plans for possible offensive operations were completed while these events played out. The military objectives for the offensive operation were derived from the national policy objectives discussed in Chapter III. Operation Desert Storm departed from the "deter and defend" objectives of Operation Desert Shield and focused on forcing Iraq to withdraw from Kuwait. Based on Secretary of Defense guidance for Operation Desert Storm, CINCCENT determined his mission to be that shown in Figure V-4.



*Figure V-4
Commander in Chief, Central
Command Mission Statement*

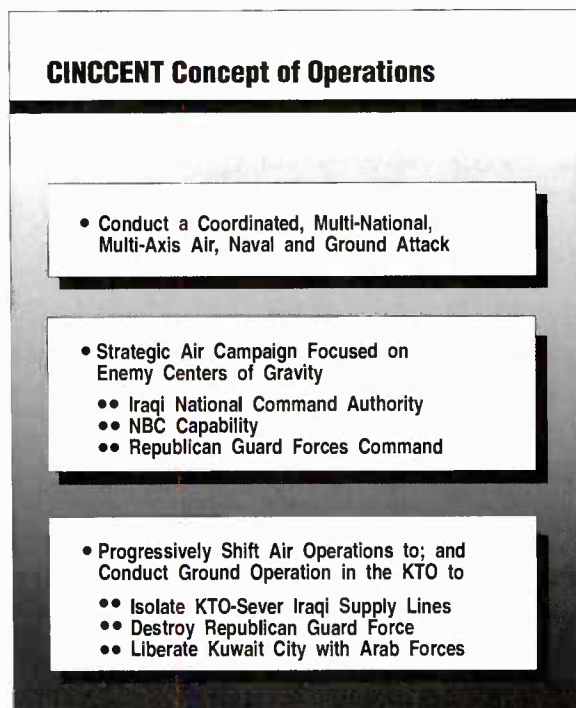
In accordance with that mission statement, CINCCENT promulgated the key theater military objectives as stated in CENTCOM Operations Order 91-001, dated 17 January as follows:

- Attack Iraqi political-military leadership and C2;
- Gain and maintain air superiority;
- Sever Iraqi supply lines;
- Destroy known nuclear, biological and chemical (NBC) production, storage, and delivery capabilities;

- Destroy Republican Guard forces in the KTO; and,
- Liberate Kuwait City.

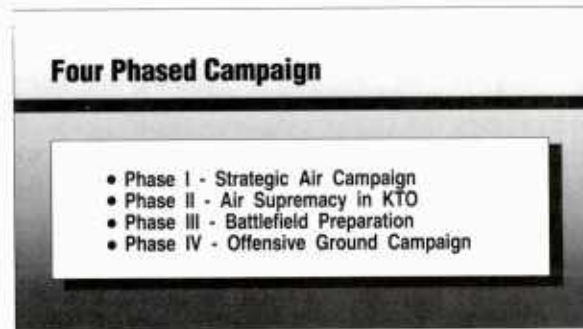
THE PLAN IS ADOPTED

As a result of the extensive planning process described above with its attendant, frequent consultation among the political and military leaders of the Coalition, the final, four-phased concept of operations was developed and adopted (Figures V-5 and V-6).



*Figure V-5
CINCCENT Concept of Operation*

As noted, the Coalition plan was crafted to emphasize Coalition strengths and to exploit Iraqi weaknesses. Years of experience in joint service, air-ground operations and similarly extensive experience in coalition operations in the North Atlantic Treaty Organization enabled CENTCOM to create the right mix of forces for



*Figure V-6
Four-Phased Campaign*

the circumstances confronting the Coalition. Especially within US forces, the experience gained from many joint and combined exercises, the presence of first-rate equipment and weapons, and the advantage of well-trained, motivated personnel led by confident, competent leaders resulted in military forces that could not only execute their battle plans, but also could improvise and overcome the unexpected. (For a detailed discussion of US military preparedness see Appendix D.) Further, well-coordinated air, ground and naval operations were expected to produce a synergy that would overwhelm Saddam Hussein with minimum Coalition losses.

Just as the theater campaign plan contemplated Coalition strengths, it anticipated Saddam Hussein's weaknesses. The Coalition heavily targeted his rigid C2 system, his strategy, doctrine, logistics infrastructure and air defense system vulnerabilities. Similarly, expecting the Iraqi army would be unable to see the battlefield in depth, the Coalition planned the long, sweeping ground force maneuvers through the desert against a blinded enemy.

Coalition political leaders and commanders planned to use airpower and ground combat power to eject Iraq's forces from Kuwait. The Coalition also sought to destroy Iraqi ability to threaten regional peace and stability further. The Coalition would accomplish this by attacking carefully selected targets, but leave most of the basic economic infrastructure of the country intact. Collectively, these actions would weaken Saddam Hussein's regime and set the stage for a stable regional military balance. Figure V-7, extracted from the CENTCOM OPLAN, relates the phases of the theater campaign to military objectives.

Theater Objectives	Phase I STRATEGIC AIR CAMPAIGN	Phase II AIR SUPREMACY IN THE KTO	Phase III BATTLEFIELD PREP	Phase IV GROUND OFFENSIVE CAMPAIGN
Leadership/C3	X			
Air Supremacy	X	X		
Cut Supply Lines	X	X	X	X
NBC Capability	X		X	
Destroy Republican Guards	X		X	X
Liberate Kuwait City				X

*Figure V-7
Theater Campaign Plan and Military Objectives*

Air Campaign Plan in Overview

The air campaign was developed to provide the President an offensive option in the early fall. It was a "strategic" plan designed to attack Saddam Hussein's vital centers of gravity. The concept was designed to paralyze the Iraqi leadership's ability to command and control (C2) its forces, to destroy known Iraqi weapons of mass destruction, to render Iraqi forces in the KTO combat ineffective, to prepare the battlefield for ground force operations, and to minimize the loss of life for Coalition forces. The air campaign was designed to be executed in three phases and its success depended on overwhelming the Iraqi military command structure and air defenses, gaining accurate intelligence, exploiting technological advantages, and, ultimately, on the ability of the combat crews. Once the air attacks had brought the ratios of combat power to an acceptable level, and if the Iraqis had not yet complied with UN demands, multinational air and ground forces would conduct a coordinated combined arms attack to eject Iraqi forces occupying Kuwait and to destroy those forces remaining in the KTO. By January, there were enough air forces available that Coalition leaders decided to execute the three phases of the air campaign almost simultaneously, thus applying overwhelming pressure from the opening minutes of the war. (Chapter VI provides detailed discussion on the Air Campaign.)

The air campaign was intended to achieve the specific objectives listed below:

- Gain and maintain air supremacy to permit unhindered air and ground operations.
- Isolate and incapacitate the Iraqi regime.
- Destroy Iraq's known NBC warfare capability.
- Eliminate Iraq's offensive military capability by destroying key military production, infrastructure, and power capabilities.
- Render the Iraqi army and its mechanized equipment in Kuwait ineffective, causing its collapse.

Ground Campaign Plan in Overview

The ground campaign plan envisioned a main attack coming as a "left hook" by armor-heavy forces against Iraq's right flank, sweeping in from the west to avoid most fixed defenses and to attack one of Saddam Hussein's centers of gravity, the Republican Guard armored and mechanized divisions. Overwhelming combat power; rapid maneuver; deception; a sound, combined arms approach; a well-trained, highly motivated body of troops; and a skilled team of combat leaders in the field, were crucial factors in the plan for the success of the ground phase. The main attack would be supported by an elaborate deception operation, including an amphibious feint, and by supporting attacks along the Kuwaiti-Saudi border to fix Iraqi forces in Kuwait and to liberate Kuwait City. Throughout, the plan was intended to achieve the objectives decisively and with minimum casualties. (Chapter VIII provides detailed discussion on the Ground Campaign.)

Objectives for the ground attack were:

- To complete the envelopment with a US corps sized armored force positioned west of the Republican Guards Forces Command (RGFC) and a US corps armored force positioned south of the RGFC. A combined Egyptian, Syrian, Saudi, Nigerian, and Kuwaiti armored heavy force would be positioned on the north-south LOCs in Kuwait.
- Draw Iraq's reserve forces away from the main attack with deception, feints and two supporting attacks.
- The US supporting attack was to defend the right flank of the main attack from a counterattack by the tactical reserves, draw forces away from the main attack, and block LOCs.

- The main attack was to bypass forces and attack west of the Kuwait border, occupying a position to the west of the RGFC to prevent successful counterattack by Iraq's strategic reserve and attack the RGFC.
- Conduct psychological operations (PSYOP) to degrade Iraqi morale.
- Use Special Operations Forces (SOF) for deception, direct action, and surveillance.
- Use electronic warfare to disrupt Iraqi communications from corps to brigade after this first supporting attack began; from corps to General Headquarters before the western supporting attack began.

Maritime Campaign Plan in Overview

NAVCENT planned its major maritime tasks within the framework of CENTCOM's four-phased theater campaign plan. During phases I and II of the CENTCOM campaign plan, (strategic air strikes and air superiority over the KTO), the NAVCENT plan directed conduct of the air operation in accordance with the air tasking order; sea control and mine countermeasure operations in the northern Persian Gulf; and strikes at shore facilities threatening naval operations. During Phase III (battlefield preparation), Navy plans called for attacking Iraqi ground forces with naval air and gunfire and continuing phase I and II operations. The final tasks in the NAVCENT plan would take place during Phase IV (Offensive Ground Campaign). Naval and amphibious forces would conduct feints and demonstrations in the KTO; be prepared to conduct amphibious operations to link up with I MEF near Ash Shuaybah; and, continue execution of Phase I, II, and III tasks. (Chapter VII provides detailed discussion on the Maritime Campaign.)

Navy Component, Central Command (NAVCENT's) primary objectives were to:

- Provide naval operations in support of Coalition ground, air, and sea units.
- Support maritime interception operations.
- Provide naval tactical aircraft and Tomahawk land-attack missiles strikes against Iraqi forces.
- Maintain an expeditionary amphibious assault capability.
- Conduct offensive operations in the Northern Persian Gulf.
- Defend the coastlines of Saudi Arabia, United Arab Emirates, Qatar, Bahrain, Oman, and to patrol adjacent maritime areas.

Deception Operations Plan in Overview

Throughout the planning process, CINCCENT emphasized the need for a comprehensive plan to deceive Iraqi forces regarding Coalition intentions and to conceal the Coalition scheme of maneuver. The deception plan was intended to convince Iraq the Coalition main attack would be directly into Kuwait, supported by an amphibious assault. The plan also sought to divert Iraqi forces from the Coalition main attack and to fix Iraqi forces in eastern Kuwait and along the Kuwaiti coast.

All components contributed to the deception. Among the activities planned to support the deception were Navy feints and demonstrations in the northern Persian Gulf, Marine landing exercises along the Gulf and Omani coast, positioning of a large amphibious task force in the Gulf, and air refueling and training activity surges that desensitized the Iraqis to the real pre-attack buildup. The absence of air attacks on some western targets was also to contribute to the impression the Coalition main attack would come from the vicinity of the Saudi-Kuwaiti border and from the sea. This impression was to be reinforced by USMC and Joint Forces East (JFC-E) operations south of Kuwait to fix Iraqi divisions along Kuwait's southern border. Raids and some SOF activities were expected to contribute to Saddam Hussein's confusion as to the most likely location for the main attack.

In early November, intelligence projections indicated three more Iraqi infantry divisions could deploy to the KTO in the next two to three months. Buildup of Coalition forces south of Kuwait was attracting stronger Iraqi defensive deployments. Also, Coalition force buildup in the west caused the Iraqis to shift forces in the western KTO opposite Coalition forces. Because of Iraqi responses to Coalition deployments, a proposal to begin a near-term buildup of supplies at King Khalid Military City for the offensive was rejected. Such a buildup was certain to compromise the intended position for launching the main attack. For these same reasons, a proposed early buildup of combat forces in the west was prohibited. Instead, forces initially deployed to base camps in eastern Saudi Arabia and then moved forward to attack positions when their movements were covered by the air campaign.

None of the divisions would move until the air war had begun. Together, that and the planned ground, counter-reconnaissance battles would hinder Saddam Hussein's ability to detect and effectively react. The 1st Cavalry Division was to remain in the east, simulating the activities of the divisions which moved west, so Iraqi intelligence would not notice their absence. The 1st and 2nd Marine Divisions (MARDIV) conducted combined arms raids along the Kuwaiti border to confuse the Iraqis and focus their attention on the east. Finally, operations security practices supported deception.

THE DECISION TO REINFORCE, NOVEMBER 1990

"The President did things for us that were enormously helpful. When it was time to double the size of the force that we deployed, it would have been a relatively simple proposition to say let's see if we can't do it with smaller forces. He consistently said do whatever you have to to assemble the force and make certain that in the final analysis we can prevail at the lowest possible cost."

Dick Cheney
Secretary of Defense
21 March 1991

As the weeks went by, Saddam Hussein showed no signs of abiding by the UNSC resolutions calling for his withdrawal from Kuwait. Operation Desert Shield appeared to have met its objective of deterring an Iraqi drive into Saudi Arabia; however, Kuwait was still under Iraqi occupation. CENTCOM had developed a viable offensive campaign plan which involved considerable risk.

Opposing the 27 Iraqi divisions in the KTO, US forces in October consisted of XVIII Airborne Corps with four Army divisions, I MEF, three CVBG, an amphibious task force (ATF), and more than five fighter and bomb wing equivalents.

On 8 November, the President announced the deployment of additional US forces into theater. Forces moved during this phase included more than 400 additional USAF aircraft; three additional CVBGs; the 1st Infantry Division (Mechanized) and an armored brigade from the United States; and the VII Corps from Germany, which included two armored divisions and an armored cavalry regiment. Additionally, the 2nd MARDIV, an ATF carrying the 5th MEB, and II MEF air and logistics elements were prepared for deployment. On 14 November, the Secretary of Defense increased reserve call-up authorization for the Army to 80,000 Selected Reserves; the Navy to 10,000; the USMC to 15,000; and the USAF to 20,000. On 1 December, the Secretary again increased the call-up authorization. The Service Secretaries now were authorized to call-up 188,000 Selected Reserve members. This authorization included as many as 115,000 from the Army; 30,000 Navy; 23,000 USMC and 20,000 USAF.

As these forces continued to deploy, so did those from other Coalition partners. The remainder of what would be the major combat elements of Joint Forces Command-North moved to positions north of Hafr Al-Batin. This included the

rest of the 9th Syrian Armored Division and the 4th Egyptian Armored Division. The final elements of 1st UK Armoured Division, whose 7th UK Armoured Brigade had arrived earlier and was attached to I MEF, arrived in late December. Additional French reinforcements arrived during this period. By mid-January, all units that were to participate in the liberation of Kuwait had arrived in Saudi Arabia or were en route.

Iraq also increased its forces in the KTO. On 19 November, Saddam Hussein announced he was reinforcing with an additional 250,000 men. This was to be accomplished by mobilizing seven additional divisions and activating 150,000 reservists and draftees; these units began arriving immediately. By early January, the Iraqi KTO order of battle had reached the equivalent of 43 divisions organized into four corps and the RGFC. These included seven armored, four mechanized, 29 infantry, one special operations division, and several separate brigades. CENTCOM estimated the forces had more than 4,500 tanks, 2,800 armored personnel carriers, and 3,200 artillery pieces. Iraq could deploy no more meaningful combat power to the KTO. Nearly all of its armored and mechanized divisions were committed to the theater; more infantry would only add to the logistics burden and strip the rest of Iraq of internal security forces.

As additional US and Coalition air and ground combat forces arrived, offensive plans were adjusted to use the full array of available military power. Coalition strength increased steadily. By early February, with the deployment of 500 additional strike aircraft from the United States and Europe, the VII Corps from Germany, substantial Marine forces from II MEF, a MEB on amphibious ships and additional Naval reinforcement, as well as the arrival of substantial numbers of Arab/Islamic and allied troops and equipment, the Coalition had the forces necessary for ground offensive operations to liberate Kuwait with acceptable risk.

REINFORCEMENT AND SUSTAINMENT

As the combat forces grew in-country, the demand for support – CS and CSS – grew proportionately. The US theater force structure had to be tailored to meet the demand. Since most Army CS and CSS units as well as some essential combat units are in the Reserve Components (RC), the military services asked for and received additional authority to call more units and individuals to active duty. In late November, the Secretary of Defense determined the Presidential Call Up Authority announced 8 November was insufficient to meet the needs of the theater of operations. The JCS examined their requirements and prepared a decision briefing for the President. At that mid-December briefing, the Services explained their complete unit requirements. The President agreed to authorize the ceiling limits set forth in Section 673, Title 10, Partial Mobilization. A Presidential Order was drafted and enacted on 18 January. Even with the Partial Mobilization authority in place, additional latitude gained for the RC recall, stop-loss authority, and related measures, the military force structure still lacked certain types of CS and CSS units.

Host Nation Support units and third nation donations covered the short-fall. (An in-depth discussion of non-US Coalition contributions is in Appendices I and P).

ARCENT's 22nd Support Command (SUPCOM) created the theater ground support plan, and provided and orchestrated most logistics support for US and some other Coalition forces. The ARCENT SUPCOM was the executive agent for food, water, bulk fuel, common ground munitions, port operations, inland cargo transportation, construction support, and grave registration for all US forces. The SUPCOM support plan included five phases. Phase Alpha involved repositioning support units and stocks to the north along main supply route (MSR) Dodge, while simultaneously receiving and moving VII Corps to its tactical assembly areas. SUPCOM also built large logistic bases during this phase along MSR Dodge to support ARCENT units. Phase Bravo involved moving simultaneously both the XVIII Airborne Corps and VII Corps to their attack positions. The 22nd SUPCOM helped by providing the heavy transportation assets needed to move the corps over the several hundred miles of desert. Two corps support commands established two new bases to support each corps when the offensive began. Phase Charlie entailed support and sustainment of the ground offensive into Iraq and Kuwait. The support plan called for transport of all classes of supply, especially fuel, water, and ammunition, and construction of additional logistics bases deep in Iraq to sustain the offensive. During Phase Delta, SUPCOM and Civil Affairs units supported efforts to restore facilities and services inside liberated Kuwait. Phase Echo focused on preparations for the defense of Kuwait for the longer term.

SUPCOM benefited from extensive Saudi, European, and third-nation contributions in supporting Coalition combat forces. Saudi Arabia, for example, provided approximately 4,800 tents; 1.7 million gallons of packaged petroleum, oil and lubricants; more than 300 heavy equipment transporters (HETs); about 20 million meals; on average more than 20.5 million gallons of fuel a day; and bottled water for the entire theater. Even with this level of support, ARCENT still found it necessary to continue to hunt for such critical equipment as HETs to acquire enough rolling stock to move VII Corps to its attack positions.

The focus of combat service support for MARCENT was the 1st Force Service Support Group (FSSG). The 1st FSSG had the additional tasking to maintain the Al-Jubayl Port as a major logistical node for CENTCOM. The 1st FSSG used organic motor transport assets from the 7th and 8th Motor Transport Battalions, commercial vehicles driven by the Marines of 6th Motor Transport Battalion (USMCR), Army cargo trucks, CH-46 and CH-53 helicopters as well as USAF and USMC C-130s to move supplies from the ports to the forward combat service support areas. The 1st FSSG also provided mobile combat service support detachments to regimental-size maneuver elements.

As the US forces built up the in-theater logistics and sustainment base, they also undertook an ambitious modernization program. Units deploying from the Continental United States (CONUS) arrived with current equipment. Within about three months, these units had their equipment upgraded or replaced. The Army Material Command managed some of the modernization effort through its control

element in theater. Perhaps one of the more important new items issued was the global positioning system (GPS). The GPS enabled units to navigate accurately despite the absence of prominent terrain features to guide them. Other improvements included upgrades to the Bradley Fighting Vehicle, and new trucks to improve CSS capabilities.

DECISION TO BEGIN THE OFFENSIVE

The final decision to begin Operation Desert Storm was not made by the President until early January, allowing the diplomatic overtures to Saddam Hussein's government the opportunity to succeed. Senior commanders were given the tentative go ahead for the attack just four days before the 15 January deadline. These four days provided time to concentrate on last-minute details for the execution of the complex operational plan. Unit commanders worked throughout the last days refining their plans for when the "green light had been flashed," as one commander termed the time before launching the attack. Coordination between Airborne Warning and Control System, Joint Surveillance Target Attack Radar System, air refueling tankers and numerous Coalition air forces continued in exercises up until the day before the air attack.

TRAINING FOR THE ATTACK

Coalition forces conducted a wide variety of training once they arrived in the theater of operations, ranging from some common to all (e.g., desert survival, chemical and biological warfare protective measures, and local customs) to very mission-specific training once the war plans evolved in enough detail to allow units to rehearse. In addition, some units underwent extensive new equipment training to master M1A1 tanks and other major weapons systems issued in theater. (All of the Army divisions which deployed from the CONUS received the new tanks. This meant each division had to retrain about 325 tank crews, a major challenge for units about to go on the offensive.)

Air forces trained extensively after arrival in theater to become familiar with the desert flying environment. The deploying air forces faced the challenge of strange fields, bare base operating conditions, and long sortie durations because of the distances to targets in Iraq. The numbers and types of aircraft from all the Coalition members also meant that procedures had to be created for airspace management and common safety practices instituted. One example of this was the management of airspace and tankers to provide refueling for the thousands of aircraft that would fly daily in Operation Desert Storm. Because of the distances involved, most sorties required refueling. Although in-flight refueling is normally routine, the number of fighters and tankers operating near each other, often at

night and sometimes in bad weather, added another layer of planning and difficulty to every mission. With a limited number of tankers available, procedures had to be established to get the maximum number of fighters serviced by each tanker in the shortest time possible.

The aircrews also trained to execute specific roles in the air operation. In some cases, this meant refining medium altitude tactics and practicing multiple weapons deliveries. The weather, threats, and targets in Kuwait and Iraq allowed medium altitude, multiple attacks instead of the low altitude, single pass attacks once the air environment had been shaped by air superiority and SEAD attacks. Advanced training programs such as Red Flag and Cope Thunder had laid an important foundation of skills upon which the aircrews of Operation Desert Storm built.

Ground forces generally practiced obstacle breaching techniques, attack of strongpoints, land navigation, night operations, and chemical defense. Commanders emphasized maneuver warfare in anticipation of the deep envelopment that was central to the scheme of maneuver. Most units also practiced combined arms training, integrating supporting arms, close-in fire support, air strikes, artillery fires, and use of attack helicopters with the scheme of maneuver. The 82nd Airborne Division built its own model of an Iraqi triangular defense work based on observer reports of the Iran-Iraq war. The 101st Airborne Division (Air Assault) used an abandoned village to practice fighting in an urban setting. I MEF conducted extensive live fire exercises to ensure all weapons were boresighted and zeroed. It also carried out extensive combined arms training, integrating supporting arms and close air support (CAS), to build mutual confidence between air and ground units. The MEF also constructed a mock-up of a typical Iraqi defensive strongpoint and rehearsed ways of attacking it.

Much training focused on the unique problems of desert warfare. Almost all of the Army's units benefited from training at the National Training Center (NTC), Fort Irwin, CA. Certain units like the 24th Infantry Division (Mechanized) and the USMC divisions stressed desert warfare in their training programs. Marines of the I MEF had extensive experience at the Marine Corps Air-Ground Combat Center (MCAGCC) at 29 Palms, CA. Prior training received at the NTC and MCAGCC major maneuver training areas proved to be of great value in the desert.

The USMC 2nd Tank Battalion and elements of the reserve 4th Tank Battalion had recently changed from the M60A1 to the M1 tank, and, when they arrived in theater, conducted extensive live fire training to hone their newly acquired skills.

Between late August and early January, the aircraft carriers *USS Saratoga* (CV 60), *USS Kennedy* (CV 67), and *USS Midway* (CV 41), together with their escorts, participated in exercises that were, in many ways, similar to the advanced training phase normally used by battle groups to prepare for overseas deployment. The training focus for the air wings included repulsing a potential Iraqi attack into Saudi Arabia, air and sea control, and airspace coordination in a dense air traffic environment.

In November, USMC, Navy, and USAF aircraft, and Navy Ships participated in Exercise Imminent Thunder. The final rehearsal of the Operation Desert Shield defensive plan included joint and combined air, ground, and naval portions, and an amphibious landing. The training was to prove invaluable in the offensive campaign.

Other local exercises dealt with the USAF and Naval Air Groups working on common tasks such as air interdiction, CAS, and combat search and rescue. These exercises were used to simplify peacetime rules and to coordinate procedures for implementation during the actual strike missions over Iraq or Kuwait. To increase the offensive posture and present a different air defense picture to the Iraqi defenders in Kuwait, the USAF began Operation Border Look on 17 December. The operation ran six days and allowed the Coalition to collect data on the Iraqi air defense radars and their ability to detect Coalition aircraft.

Exercises and training also were conducted across thousands of miles, between CENTCOM and Space Command (SPACECOM) forces, to develop and refine Scud warning procedures. SPACECOM cut the warning times for a Scud launch in half. CENTCOM developed ways to warn Patriot batteries and Coalition forces of Scud launches, letting Coalition units take cover and aiding Patriot units to intercept in-coming missiles.

EVE OF DESERT STORM

Status of Coalition Forces

As the UN deadline approached Coalition air forces conducted final preparations and ground forces continued to move into assembly areas. Coalition aircraft were placed on ground alert and aircrews began mission planning as details of the air campaign were released. Along the Saudi coast south of the Kuwait border, JFC-E, composed of Saudi and CGG units, continued to train in preparation for attacking directly toward Kuwait City while manning defensive positions along the border. On their left, I MEF was displacing its logistics bases and moving the 1st and 2nd MARDIV into assembly areas for final attack rehearsals. Farther west, Arab-Islamic forces from JFC-N, consisting of Egyptian, Syrian, Kuwaiti, Nigerian, and Saudi units, continued to screen the border area north of Hafr Al-Batin. VII Corps, still arriving from Europe and including the 1st UK Armoured Division, continued to move its forces across the desert roads to assembly areas west of Wadi Al-Batin, while the XVIII Airborne Corps displaced even farther west, where it linked with the 6th French Light Armored Division. (Chapter VI - Air Campaign and Chapter VIII - Ground Campaign provide maps and graphics depicting disposition of Coalition Forces)

Coalition forces exhibited a readiness that, in many cases, exceeded peacetime expectations. For US forces, maintenance readiness of such major items as M1 tanks, M2/3 fighting vehicles, AH-64 attack helicopters, and AV-8B attack aircraft often exceeded 90 percent. Some units, such as the USMC 2nd Tank Battalion recently had received Abrams tanks. The 1st UK Armoured Division was equipped with the Challenger tank, considered one of the better main battle tanks built. Saudi, Qatari and Kuwaiti forces, accompanied by US and other advisors, trained constantly, displaying a confidence in their capabilities. Kuwait Army units had been rebuilt since the Iraqi invasion and were now equipped with modern Yugoslav M84 tanks and Soviet BMP-2 infantry fighting vehicles. Although long LOCs and harsh conditions strained the structure, equipment and supplies continued to flow into the theater in order to meet the stockage levels CENTCOM established and supply points located at forward sites in the desert were stockpiling for combat.

Perhaps most important, the morale of Coalition troops, who felt confident they could defeat the Iraqis in battle, was high. Discipline problems were almost nonexistent. Cross-training between US and other Coalition forces, conducted throughout Operation Desert Shield, ensured mutual understanding. Among Coalition troops, high morale reinforced the advantages of superior equipment and training.

Status of Iraqi Forces

It was not clear until the offensive had begun that Saddam Hussein would choose to remain on the defensive. Iraqi preparations throughout the prior months had continued to raise the readiness of forces and it was estimated that they remained capable of launching an offensive (as they were later to attempt at Al-Khafji). The Iraqi Air Force stepped up training and defensive patrols from airfields in central and southern Iraq. Intelligence analysts estimated the Iraqi Air Force to be capable of surging up to 900 to 1,000 sorties daily, although the Iraqi capability to sustain such a sortie rate was questioned. Air C2, logistics, and maintenance sites had been dispersed and hardened. Surface-to-surface missiles, most notably the Scud, had been on alert for several months and several test firings were conducted in the late Fall. The Scuds were capable of reaching targets in Saudi Arabia from southern Iraq. Some intelligence analysts predicted many launchers would be exceedingly difficult to locate because of their mobility and ability to hide. Iraq also emplaced Silkworm missiles at strategic coastal points and actively mined Persian Gulf waterways. Surface-to-air missiles (SAM) and anti-aircraft artillery (AAA) remained concentrated around major population centers and strategic military targets. Many of Iraq's SAM launchers, even those with mobile capabilities, were tied to point defense of fixed targets. At least one battery of captured Kuwaiti HAWK missiles was thought to have been positioned south of Baghdad. While the air defense system used by Iraq could provide centralized control of anti-air assets, barrage fire was thought by Coalition intelligence analysts to be the most probable means of air defense engagements, particularly with AAA.

Iraqi weapons of mass destruction, particularly CW, posed a formidable threat. Although Iraqi nerve agents deteriorated after being placed in munitions, DIA assessed on 11 January that Iraq was probably in the final stages of an additional chemical production cycle and that munition fill activity was continuing, putting the chemical arsenal on a high level of readiness. Moreover, some Iraqi weapons, such as mustard agents, did not deteriorate and others remained dangerous even after deterioration. Most artillery in the Iraqi inventory was capable of firing chemical shells, and aircraft could be armed with chemical bombs or spray tanks. Iraqi training emphasized the use of CW. During the later stages of the Iran-Iraq war, tactical commanders displayed a keen understanding of the use of CW, often fully integrating them into their fire support plans. Although some units, particularly infantry and People's Army units, were short of chemical protective equipment, the stated willingness of Saddam Hussein to use CW combined with the Iraqi army's extensive prior use of CW made the threat of great concern to the Coalition.

Inside the KTO, at least 43 divisions were arrayed in depth with strong operational and tactical reserves. In Kuwait and stretching several miles into southern Iraq, Iraqi infantry had established two belts of minefields and obstacles, backed by trench lines and strongpoints. Thousands of mines had been sown in the sands, covered by extensive barbed wire obstacles, fire trenches, antitank ditches and berms. Dug-in infantry was reinforced by revetted tanks and artillery, all backed by armored reserves of brigade strength or larger. Along the beaches, in testimony to Iraqi concern about an amphibious assault, no fewer than four infantry divisions and a mechanized division dug in behind minefields and obstacles, while strongly fortifying coastal sections of Kuwait City. In central Kuwait, roughly in the area between Ali As-Salim Air Base and the Kuwait International Airport, one armored and two mechanized divisions formed strong corps-level reserves, with additional forces to the northwest. Along the main north-south road from Kuwait City to Iraq stood an operational reserve of several regular Army armored and mechanized divisions. Positioned along the Iraq-Kuwait border, the theater reserve of at least six Republican Guards Divisions and other Army armored, mechanized, and infantry divisions formed the backbone of Iraqi forces in the KTO. (Disposition of Iraqi forces in January is depicted in Figure V-8.)

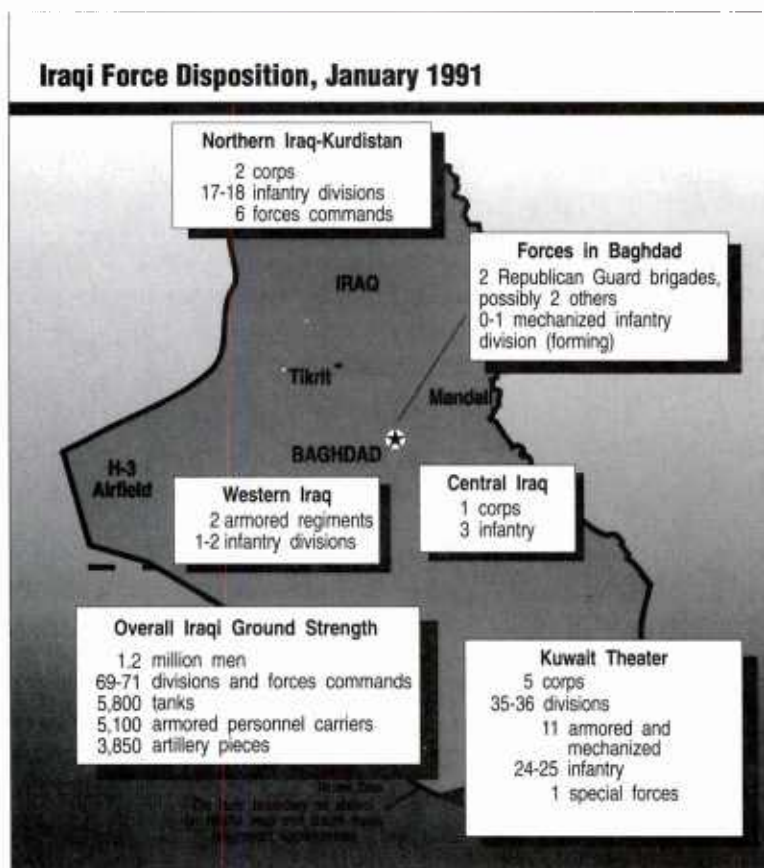


Figure V-8
Estimated Disposition of Iraqi Forces, January 1991

Iraqi Defensive Concept of Operations

While it was clear Iraq had established a formidable array of defenses in the KTO, its intentions were not clear at the time. The discussion in this section is drawn from post-war intelligence assessments.

The front line infantry divisions were to defend in sector from prepared positions. The commander of the 27th Infantry Division, VII Corps, stated his mission had been very clear, "to defend Wadi Al-Batin, period." Immediately behind the forward-deployed infantry divisions was a corps reserve. In addition to infantry divisions, the VII Corps, in the ARCENT main attack zone, deployed the 52nd Armored Division, and the IV Corps, just east of the Wadi and opposite the Multinational Force Corps, deployed the 6th Armored and 1st Mechanized divisions. The mission of the reserve forces was to counterattack any Coalition penetration within their respective sectors.

To the rear of the corps reserve was the operational reserve. In the western part of the KTO, the operational reserve was the Jihad Corps. It was composed of the 10th and 12th Armored divisions, its mission was to either counterattack, or to occupy blocking positions in the event of a Coalition penetration. In the eastern part of the KTO the operational reserve was the II Armored Corps comprised of the 51st Mechanized Infantry Division and the 17th Armored Division. Its missions were similar to the Jihad Corps, with the addition of countering expected airborne and amphibious assaults in Kuwait and Southern Iraq.

Behind the theater reserves, deployed in a crescent formation in Southern Iraq just north of the IV and VII Corps, was the RGFC as a theater reserve, composed of the Tawakalna Mechanized Infantry Division, the Medinah Armored Division, and the Hammurabi Armored Division. Once the main thrust of the Coalition was apparent and had been reduced by the forward divisions, the corps reserves, and the operational reserve, the RGFC would be committed as a corps to destroy the Coalition main attack.

Military Balance

By late December, CENTCOM had assessed the balance of ground forces using an assumption that the air campaign would succeed in destroying or neutralizing approximately half of the Iraqi forces in the KTO. The analysis was based on heavy brigades and was computed by axes of attack, for the main phases of the ground attack (i.e., before the breach, en route to final objectives, and before final objectives). The overall force correlations by attack axis were (Coalition forces/Iraqi forces): supporting attack 1.3/1; main attack 1.4/1; Egyptian/Syria attack 1.4/1; and MEF 0.75/1. The force correlations at the final objective (RGFC) for the supporting

and main attacks were 2.7/1 and 2.2/1, respectively. These force ratios were believed to be sufficiently favorable to ensure success.

As noted earlier, Iraqi forces also exhibited several weaknesses, some of which were not appreciated until after action surveys were conducted. Although equipped with large numbers of fighter and attack aircraft, including modern French and Soviet fighters, the Air Force was built around a core of obsolescent planes. The Iraqis were almost totally reliant on tactical intelligence systems and human intelligence to discern Coalition dispositions; as the war proceeded, Iraqi forces became almost totally blind. Finally, the Iraqis had assumed a static defensive posture, conceding the initiative to the Coalition. Obstacles dug in September and October had been neglected in the following weeks. Some minefields had been exposed by wind and mines could be seen from the air or by approaching ground troops. Many alternate positions and trenches had filled with sand. Maintenance of equipment suffered from the embargo and extended logistics lines. In some cases, units resorted to cannibalization to meet maintenance needs. As the UN deadline approached, intelligence analysts detected some indications of morale and cohesion problems among some front line Iraqi troops in the KTO. Later information revealed that those problems had become increasingly severe in many units.

Despite its core of highly trained and motivated Republican Guards and a few elite regular Army units, the bulk of the Iraqi Army was composed of poorly trained conscripts. Most infantry divisions in Kuwait, charged with defending the extensive minefields, were made up of these second-class troops. As post-war information was to show, desertions, particularly in some front-line infantry units, became almost epidemic. Many soldiers simply went home. Iraqi propaganda and political maneuvering resulted in a backlash among Iraqi troops, particularly those in Kuwait. They began to realize they had been placed in the distasteful position of an occupying force in another Islamic country, faced with fighting their religious and cultural brothers. Increasing numbers of deserters expressed a growing antipathy towards Saddam Hussein, some claiming their comrades would not fight. Reports of Iraqi discipline squads, ordered to shoot deserters, began to filter into Coalition intelligence. Those Iraqi soldiers who remained suffered from food shortages. To induce them to stay, Saddam Hussein authorized special increases in pay; the troops were given worthless scrip which only served to make them more cynical.

Nevertheless, the Iraqi order of battle on the eve of war was formidable. DIA assessed Iraq to have 540,000 troops, more than 4,200 tanks, more than 2,800 armored personnel carriers, and approximately 3,100 artillery pieces fielded in the KTO. They could draw on up to 30 days of ammunition stockpiled in Kuwait and southern Iraq in the event of combat, with at least three days of ammunition being carried by each unit. An extensive air defense umbrella of AAA and SAM, to include several SA-2 and SA-3 launchers in Kuwait, provided some protection from air attack. These systems were highly mobile and capable of putting up a substantial challenge to Coalition aircraft, particularly those that attacked using low-level tactics. Although few aircraft were based inside the KTO, the Iraqi Air Force had demonstrated the capability to shift aircraft rapidly and conduct strikes and air defense operations throughout the KTO as well as into Saudi Arabia. The Iraqi Navy

positioned missile-firing fast patrol boats and coastal defense surface-to-surface missiles along the Kuwaiti coast that could disrupt any attempts at amphibious landings. More importantly, Iraqi mine layers had begun sowing mines in the northern Gulf to help ward off any Coalition amphibious attack.

On the Coalition side, total numbers roughly equaled Iraqi totals, but ground forces were thought to be numerically inferior. Despite that apparent disadvantage, Coalition forces held several important tactical and operational advantages. These included high technology weapons, an extensive intelligence network, and a combined air-land-sea capability that sought to create strategic, operational, and tactical dilemmas with which the Iraqi command structure could not cope. While the state of training of the Coalition units varied, overall it was superior to that of the Iraqis, particularly those Iraqi forces occupying Kuwait.

In Saudi Arabia and the Gulf, seven Army divisions, two USMC Divisions, a British armored division, a French light armored division, and the equivalent of more than four Arab/Islamic divisions were moving into their assembly areas. There were 1,736 combat aircraft from 12 Coalition countries flying from bases and aircraft carriers throughout the theater and Turkey, and 60 B-52s waited at worldwide locations. In the Persian Gulf and Red Sea, naval forces including six aircraft carrier battle groups, two battleships, several submarines capable of launching cruise missiles, and the largest amphibious force mustered since the Korean War, carrying nearly 17,000 Marines, were prepared to carry out their missions. A massive air and sea logistics effort continued to pour supplies into the theater. In all, more than 540,000 Coalition troops from 31 countries prepared to liberate Kuwait.

Of crucial importance, the Coalition would fight with a level of initiative and flexibility far superior to the Iraqis. Despite its disparate nature, the Coalition maintained unity of effort through a clear understanding of the mission, open coordination between elements, and a command structure that enabled each unit to carry out its mission unhindered by over-centralized control. US military warfighting doctrine emphasized the dislocation of enemy forces in a fluid battlefield. US and many Coalition commanders were capable of exercising a level of initiative of which the Iraqi commanders were totally incapable. C2 systems enabled rapid shifting of forces, particularly aircraft, to crucial areas. In the ensuing fighting, this flexibility would become decisive. Superior training and organization enabled the US forces, and much of the Coalition as a whole, to outfight the centralized and cumbersome Iraqi armed forces.

With the likelihood of war looming, Saddam Hussein's warfighting strategy seems to have been based on several elements. First, he continued his efforts to divide the Coalition by appealing to radical Arab distrust of the West and Israel, while portraying Kuwait as a nation not worthy of Arab bloodshed. Continual references to the Israeli threat and attempts to tie negotiations to the Palestinian question played on the very real concerns of the Arab world. Subsequent attempts to draw the Israelis into the war reinforced these efforts. Second, he hoped to outlast the Coalition by prolonging the crisis and waiting for resolve to erode. This belief in his political ability to outlast the Coalition manifested itself in bellicose

statements, occasionally conciliatory gestures, and continuous propaganda aimed at deterring a Coalition attack with the threat of heavy casualties. Even after fighting started, Iraqi deserters and, later, enemy prisoners of war often expressed a belief that, somehow, Saddam Hussein would once again politically maneuver his way to a favorable resolution. Third, if these measures failed, Saddam threatened a costly war of attrition that, he hoped, would quickly turn public opinion against the war. This strategic objective was manifested in the Iraqi dispositions, reflecting the preconception that the Coalition would attack frontally through Kuwait into prepared defenses. Finally, Saddam Hussein may have calculated he would withdraw the bulk of his forces even after war began, if necessary.

Saddam Hussein suffered from several miscalculations, however. First, he underestimated the Coalition's resolve and strength. Believing he could sever the ties between the United States and Western nations and the Arab/Islamic states, he continually orchestrated propaganda and political overtures in an attempt to create internal strife, to no avail. When conflict seemed inevitable, he mistook democratic debate for weakness, threatening the Coalition with heavy casualties to shake its resolve. Next, the Iraqi defensive posture in the KTO, which seemed to ignore the exposed flank in the Iraqi desert, underscored the mistaken belief that the Coalition would not attack through Iraq to free Kuwait. Enhanced by the ongoing Coalition deception plan, this miscalculation positioned Iraqi forces facing south and east, intent on fighting a battle of attrition for which the Iraqi commanders were well trained, based on their combat experiences in Iran. Third, Saddam Hussein completely underestimated the efficacy of modern weapons and combat technology. Basing his calculations on his experiences in the Iran-Iraq War, he failed to comprehend the destructive potential of the air, land, and naval power that would be used against him. The battlefield advantages of precision-guided munitions, stealth technology, electronic warfare systems, a host of target acquisition and sighting systems, and highly mobile, lethal ground combat vehicles, used by highly trained personnel, were simply not understood by the Iraqis. First his air force and air defense forces, then his ground forces, and ultimately the Iraqi people suffered for Saddam Hussein's gross miscalculations.

Overall, the Coalition succeeded in what Sun Tzu calls the greatest achievement of a commander, defeating the enemy's strategy. Saddam Hussein's strategy was to inflict casualties on the Coalition to break our will, to draw Israel into the war to break the Coalition and to inflict casualties on Israel to claim a victory among the Arabs. Expecting that the Coalition would blunder into these traps, Saddam found himself frustrated. Taking significant casualties himself, without inflicting any serious blows on his enemies, he launched the ground attack on Khafji. His disastrous defeat in that engagement foreshadowed his larger, ultimate defeat.

OBSERVATIONS

Accomplishments

- The Coalition developed and executed a coordinated, multi-national, multi-axis, combined arms theater campaign that succeeded in defeating Iraq.
- The Coalition built a multi-national armed force capable of offensive operations and the logistics to support and sustain it.
- Some Coalition forces modernized their units on the eve of battle, successfully undergoing new equipment training and improving the combat potential of their units.
- The services exploited the time available to reach the highest possible levels of unit proficiency.
- The United States demonstrated the ability to deploy and support large, complex forces far from home.
- The UNSC resolutions made US domestic support for offensive operations easier to garner, and contributed to US national political will. The UNSC resolutions made actions against Iraq legitimate in the eyes of much of the world, and made it easier for many nations to support Coalition actions with donations of money or supplies.
- Political will, excellent planning, prior training and exercises, and Coalition solidarity, were decisive determinants of success.

Shortcomings

- Availability of staging bases and a well-developed infrastructure, especially airfields and ports, were crucial to the Coalition's success. These facilities and resources may not be as readily available in future contingencies without considerable emphasis on HNS agreements.
- US strategic lift, the CS and CSS capabilities inherent in the active and RC units deployed, in-theater facilities, HNS, and the time to build the infrastructure in theater, facilitated transition to the offensive. The eventuality of short warning contingencies necessitates actions to improve strategic lift capabilities and enhance host nation support.

Issue

- The Coalition had sufficient time to plan and prepare for the offensive. This was a significant advantage that may not be the case in future crises.

CHAPTER VI

THE AIR CAMPAIGN

"Gulf lesson one is the value of air power. . . . (it) was right on target from day one. The Gulf war taught us that we must retain combat superiority in the skies. . . . Our air strikes were the most effective, yet humane, in the history of warfare."

President George Bush
29 May 1991

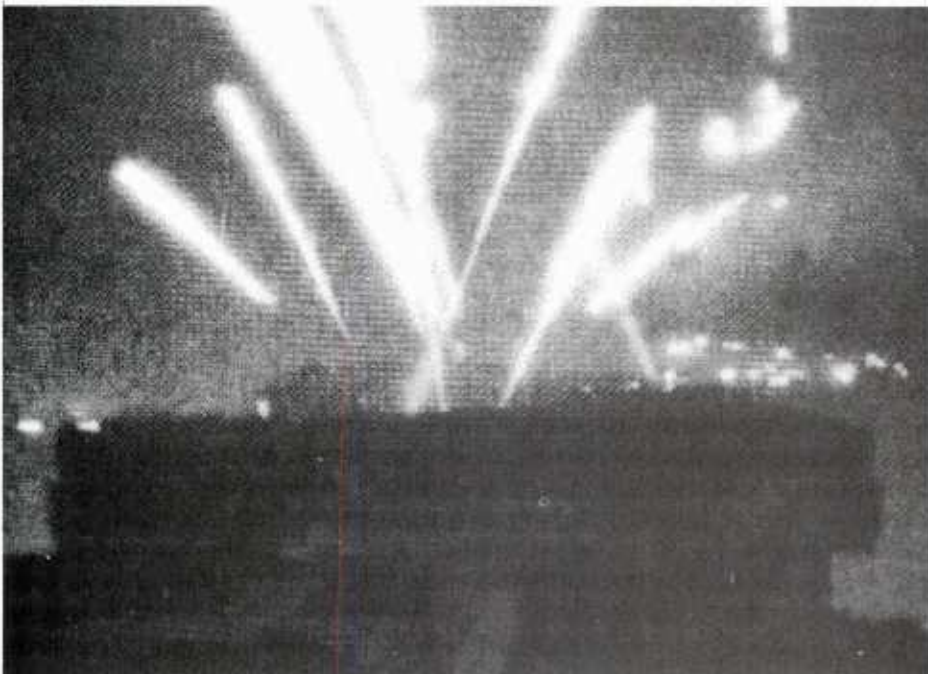


Figure VI-1

Shortly after 0230, 17 January, Iraqi Antiaircraft Artillery Illuminates the Baghdad Skyline in Response to the Air Campaign. (Photo: Copyright Capital Cities/ABC, Inc., 1991)

INTRODUCTION

In immediate response to the Iraqi invasion of Kuwait, the United States rapidly deployed substantial land- and sea-based air power to the Central Command (CENTCOM) area of responsibility (AOR) and increased the readiness level of forces outside Southwest Asia. Simultaneously, the Air Staff, in response to the Commander-in-Chief, Central Command's (CINCCENT) request, developed a concept plan, Instant Thunder, which formed the basis for CENTCOM's more comprehensive Operation Desert Storm air campaign. This, in turn, was devised to help achieve the President's four objectives: force unconditional Iraqi withdrawal from Kuwait, re-establish the legitimate Kuwait government, protect American lives, and ensure regional stability and security.

The air campaign was designed to exploit Coalition strengths (which included well-trained aircrews; advanced technology such as stealth, cruise missiles, precision-guided munitions (PGMs), superior command and control (C2), and ability to operate effectively at night); and to take advantage of Iraqi weaknesses (including a rigid C2 network and a defensive orientation). Coalition air planners intended to seize air superiority rapidly and paralyze the Iraqi leadership and command structure by striking simultaneously Iraq's most crucial centers of gravity: its National Command Authority (NCA); its nuclear, biological, and chemical (NBC) warfare capability; and the Republican Guard divisions.

The Strategic Air Campaign formed Phase I of the four phases of Operation Desert Storm. Phase II focused on suppressing or eliminating Iraqi ground-based air defenses in the Kuwait Theater of Operations (KTO). Phase III emphasized direct air attacks on Iraqi ground forces in the KTO (including the Republican Guard Forces Command (RGFC) and the Iraqi Army in Kuwait). Phases I-III constituted the air campaign. Phase IV, the ground campaign to liberate Kuwait, used air attacks and sea bombardment in addition to ground attacks on concentrations of Iraqi forces remaining in the KTO. Concurrent with the Offensive Ground Campaign was an amphibious landing option, Operation Desert Saber, to be executed as required for the liberation of Kuwait City. The theater campaign plan recognized the phases were not necessarily discrete or sequential, but could overlap as resources became available or priorities shifted.

On 16 January, at 1535 (H - 11 hours, 25 minutes), B-52s took off from Louisiana carrying conventionally armed air-launched cruise missiles (ALCMs). They would launch their ALCMs approximately two hours after H-Hour. The first irretrievable hostile fire in Operation Desert Storm began at approximately 0130 (H-90 minutes), 17 January, when US warships launched Tomahawk land attack missiles (TLAMs) toward Baghdad. At 0238, while the TLAMs were still in flight, helicopters attacked early warning radar sites in southern Iraq. Stealth fighters already had passed over these sites enroute to attack targets in western Iraq and Baghdad. The helicopter, F-117A, cruise missile, F-15E Eagle fighter, and GR-1 Tornado fighter-bomber attacks helped create gaps in Iraqi radar coverage and the C2 network for the non-stealth aircraft which followed. Powerful air strikes then continued

throughout the country. Within hours, key parts of the Iraqi leadership, C2 network, strategic air defense system, and NBC warfare capabilities were neutralized. By the conflict's first dawn, air attacks on Iraqi forces in the KTO had begun. These led to a steady reduction of their combat capability, and made it difficult for them to mass or move forces without coming under heavy Coalition air attack, according to the Defense Intelligence Agency (DIA) and CENTCOM. Hundreds of Coalition aircraft participated in these missions, marked by precision and impact, while suffering extremely low losses. Coalition air power continued to destroy strategic targets in Iraq and the KTO. Although hindered by bad weather, the air campaign, which extended throughout the 43 days of Operation Desert Storm, won air supremacy and met its key objectives, although suppression of Scud attacks proved far more difficult than anticipated and the destruction of Iraqi nuclear facilities was incomplete because of intelligence limitations.

Phase II of Operation Desert Storm sought the systematic neutralization or destruction of Iraqi surface-to-air missile (SAM) systems and large-caliber antiaircraft artillery (AAA) pieces that threatened Coalition aircraft in the KTO. The suppression of enemy air defenses (SEAD), which began in the air war's first minutes, not only attacked enemy air defense weapons, but also the C2 centers that linked them. Many accompanying acquisition, fire control, and target tracking radars, according to DIA reports, also were put out of action or dissuaded from coming on line. In this way, Coalition air planners carved out a medium- and high-altitude sanctuary, which allowed friendly aircraft to operate in the KTO with some degree of safety.

Coalition electronic warfare (EW) aircraft were invaluable during this phase. With active jamming, passive location systems, and antiradiation missile delivery ability, they either attacked enemy weapon systems or rendered them ineffective. Because of the number and mobility of enemy antiaircraft systems, SEAD continued throughout the war. It paved the way for strike aircraft to begin direct air attacks on enemy artillery, armor, and troops in the KTO.

Direct air attacks on Iraqi forces in the KTO continued until the cease-fire. In early February, the weight of Coalition air power shifted from strategic operations in Iraq to attacks on ground forces in the KTO, which could not resist the aerial attack effectively. By G-Day, interdiction of supply lines to the KTO reduced deliveries to a trickle. These and direct attacks on Iraqi supply points and in-theater logistical transportation, according to enemy prisoner of war (EPW) reports, resulted in major local shortages of food for fielded Iraqi forces in Kuwait. The RGFC and other high priority units, however, predominantly were located farther from Coalition forces, closer to rear-area supply depots, and tended to be better supplied than frontline forces.

Coalition aircrews developed innovative tactics to use PGMs against Iraqi armor. While estimates vary, by the start of the ground offensive, Army Component Central Command (ARCENT) estimated many of Iraq's tanks, other armored vehicles, and artillery in the KTO had been destroyed from the air. CINCCENT had stated he would not recommend starting the ground offensive until the combat effectiveness of the forces in the KTO had been degraded by half. The destruction of Iraqi

operational command centers and communications links prevented effective military C2 and helped prepare for the rapid, successful Offensive Ground Campaign. When the Iraqis attempted their only substantial ground offensive operation, at the Saudi Arabian town of Al-Khafji, Coalition air power responded rapidly to help ground forces defeat the initial assault. At the same time, aircraft attacked and dispersed Iraq's two-division follow-on force before it could join the battle.

When ground forces encountered Iraqi resistance, Coalition airpower again was called on to attack the enemy and help minimize Coalition losses. This often required aircraft to fly lower into harm's way to identify and attack targets. Most Coalition air losses during the latter stages of the war were suffered in direct support of ground forces. During this final phase, the Coalition's speedy conclusion of the war, with minimal casualties, highlighted the synergy of powerful air and ground forces.

Decision to Begin the Offensive Ground Campaign

CINCCENT has said that several factors influenced his belief as to when the Offensive Ground Campaign should begin. These factors included force deployments and planning, logistics buildup, weather forecasts favorable for ground offensive operations, cohesion of the Coalition, and attack preparations, along with the air campaign. All were important in reducing risks and enhancing the probability of success with limited losses. While precise measurement of force ratios was not possible, senior commanders considered that Iraqi combat effectiveness needed to be reduced by about half before the ground offensive began. Combat effectiveness included both measures such as numbers of soldiers, tanks, armored personnel carriers (APC), and artillery (and degradation thereof), as well as less measurable factors such as morale. Once air operations began, Iraqi reactions could be analyzed to provide further evidence on their military capability. For example, the Iraqi failure at Khafji indicated an inability to orchestrate the sorts of complex operations needed for a mobile defense. Further, the battle seemed to indicate a decline in the will of Iraqi soldiers while at the same time it provided a great boost in morale and confidence among Coalition Arab forces.

PLANNING THE OFFENSIVE AIR CAMPAIGN

The Early Concept Plan – Instant Thunder

During the initial days after the invasion of Kuwait, the CENTCOM and Service component staffs began planning for defensive and offensive operations from Saudi Arabia. The Air Force Component, Central Command (CENTAF) staff began planning

an air campaign on 3 August; this provided the basic input for CINCCENT and CENTAF commander briefings to the Chairman of the Joint Chiefs of Staff (CJCS), the Secretary of Defense, and the President.

The Secretary of Defense instructed CJCS and CINCCENT to develop an offensive option that would be available to the President if Saddam Hussein chose to engage in further aggression or other unacceptable behavior, such as killing Kuwaiti citizens or foreign nationals in Kuwait or Iraq. This planning was the basis of CINCCENT's 8 August request to the Air Staff for a conceptual offensive air campaign plan directed exclusively against strategic targets in Iraq. He determined it would not be advisable to divert the deployed CENTAF staff from organizing the arrival and beddown of forces, while preparing a plan to defend Saudi Arabia from further Iraqi aggression. (See Chapter III for details of the D-Day plan). On 10 August, the Air Staff's deputy director of plans for warfighting concepts briefed CINCCENT in Florida on the Instant Thunder concept plan. The CJCS was briefed the following day and directed the Air Staff to expand the planning group to include Navy, Army, and Marine Corps (USMC) members and to proceed with detailed planning under the authority of the Joint Staff's director of operations. The CJCS reviewed the concept with the Secretary of Defense and received his approval.

When CINCCENT saw the expanded briefing again on 17 August, it bore the Joint Chiefs of Staff seal; by then both the Chief of Naval Operations and the Commandant of the Marine Corps also had accepted the concept plan. On 25 August, CINCCENT briefed the Secretary of Defense and the CJCS on a four-phase offensive campaign plan: Phase I, a Strategic Air Campaign against Iraq; Phase II, Kuwait Air Campaign against Iraqi air forces in the KTO; Phase III, Ground Combat Power Attrition to neutralize the Republican Guards and isolate the Kuwait battlefield; and Phase IV, Ground Attack, to eject Iraqi forces from Kuwait. The broad outlines of Operation Desert Storm had taken shape, but plans were further developed and refined for the next several months. As the plan was developed further, the Secretary of Defense and CJCS continued to review it in detail, culminating in an intensive two-day review in Saudi Arabia in December.

Non-US Coalition members became involved in planning during September. By the end of November, British Royal Air Force (RAF) and Royal Saudi Air Force (RSAF) planners were integrated fully.

The Air Staff concept plan had been called Instant Thunder to contrast it with Operation Rolling Thunder's prolonged, gradualistic approach to bombing North Vietnam during the 1960s. Instead of piecemeal attacks designed to send signals to enemy leaders, Instant Thunder was designed to destroy 84 strategic targets in Iraq in a single week. If all went well, air attacks would paralyze Iraqi leadership, degrade their military capabilities and neutralize their will to fight. There was, however, great concern on the part of CJCS and CINCCENT, particularly in August and the first part of September, that an aggressive Iraqi ground offensive in the absence of significant heavy Coalition ground forces might succeed in seizing key airfields as well as ports, water facilities, and oil production sites.

As the air planners built Instant Thunder, they realized that in this war, the development of PGMs and active and passive antiradar technologies (stealth, jamming, antiradiation missiles) would allow attacks directly against the enemy leadership's ability to function. These attacks could neutralize the regime's ability to direct military operations by eroding communications, and depriving leaders of secure locations from which to plan and control operations. These leadership capabilities became key targets for Instant Thunder, and the main difference between it and more traditional strategic bombing campaigns.

In addition to attacks designed to influence the Iraqi leadership's ability to control their forces, the plan also envisaged attacks to reduce the effectiveness of forces in the KTO. Targets included NBC facilities, ballistic missile production and storage facilities, key bridges, railroads and ports that enabled Iraq to supply its forces in the KTO, and the Iraqi air defense system.

The Air Staff planning group (known as Checkmate), working under the Air Staff's deputy director of plans for warfighting concepts, categorized strategic targets as follows:

- Leadership – Saddam Hussein's command facilities and telecommunications
- Key production – electricity, oil refining, refined oil products, NBC, other military production, military storage
- Infrastructure – railroads, ports, and bridges (initial plans expected to attack only railroads; later, ports and bridges were added when the theater plan expanded to include attacks on the fielded forces in the KTO)
- Fielded forces – air defenses, naval forces, long-range combat aircraft and missiles, and airfields. (Although not included in the early drafts the Secretary of Defense instructed CINCCENT to add the RGFC to the strategic target list because they were key to the Iraqi position in Kuwait and a serious offensive threat to Iraq's neighbors.)

Targets in each category were identified, imagery obtained, weapons and aiming points chosen, and an attack flow plan assembled using aircraft scheduled to deploy. Eventually, target identification became a joint-Service, multi-agency, and Coalition effort.

The Instant Thunder concept plan was designed to attack Iraq's centers of gravity. It envisioned a six-day (good weather and 700 attack sorties a day) attack on 84 strategic targets in Iraq. This initial plan, however, did not address some major target systems that became important in Operation Desert Storm.

Although suppressing Scud attacks later proved crucial to the strategic objective of frustrating Saddam Hussein's effort to draw Israel into the war, the missiles were not regarded initially as a threat to military forces – unless they were equipped with unconventional warheads – because of their inaccuracy. (In fact,

however, a Scud strike on a barracks in February inflicted more US casualties than any single engagement. Moreover, Scud attacks elsewhere in the theater, for example on the ports of Ad-Dammam and Jubayl, in the early stages of the war when large concentrations of VII Corps troops were waiting for their equipment to arrive by sealift, potentially could have inflicted very large casualties.) In any case, trying to find and attack such mobile, easily hidden targets promised to absorb many sorties without likelihood of much success. The early plans, therefore, concentrated on attacking the fixed Scud launch facilities and production centers.

If Iraq attacked Saudi Arabia, the CENTAF commander, who also acted as the Joint Forces Air Component Commander (JFACC), planned to concentrate air attacks on the Iraqi ground forces which might move against the Saudi oil fields and northern airfields. The Instant Thunder concept expected those targets to be attacked by RAF and Saudi Tornados, and US F-16s, AV-8Bs, A-10s, AH-64s, AH-1s, and F/A-18s.

Meanwhile, aircraft designed for long-range attacks would concentrate on strategic targets in Iraq. In time, this difference of focus lost much of its practical meaning, especially after the deployment of additional air and ground assets starting in November. An abundance of Coalition air and ground power gave assurance that an air campaign could be waged simultaneously against strategic targets in Iraq and Iraqi forces moving into Saudi Arabia, if necessary.

Instant Thunder Evolves Into Operation Desert Storm Air Campaign

During the fall, JFACC planners merged CENTAF's pre-deployment concept of operations with the Instant Thunder concept to form the foundation for the Operation Desert Storm air campaign plan.

Navy, USMC, and Army planners worked closely with Air Force (USAF) planners in August and September to draft the initial offensive air campaign plan. In Riyadh, Naval Component, Central Command (NAVCENT), Marine Corps Component, Central Command (MARCENT), and ARCENT were integral planning process members. RAF planners joined the JFACC staff on 19 September.

CENTCOM's offensive air campaign special planning group (SPG), in the RSAF Headquarters, was part of the JFACC staff and eventually became known as the Black Hole because of the extreme secrecy surrounding its activities. The Black Hole was led by a USAF brigadier general, reassigned from the *USS Lasalle* (AGF 3) where he had been serving as the deputy commander of Joint Task Force Middle East when Iraq invaded Kuwait. His small staff grew gradually to about 30 and included RAF, Army, Navy, USMC, and USAF personnel. Because of operational security (OPSEC) concerns, most of CENTAF headquarters was denied information on the plan until only a few hours before execution. By 15 September, the initial air planning stage

was complete; the President was advised there were sufficient air forces to execute and sustain an offensive strategic air campaign against Iraq, should he order one.

During October, as planning began for a possible offensive ground operation to liberate Kuwait, air planners began to give more attention to Phase III, air attacks on Iraqi ground forces in the KTO. There was concern a ground assault against the well prepared KTO defenses might result in large and unnecessary loss of life. If Saddam Hussein did not comply with UN demands, air attacks would help the Offensive Ground Campaign meet its objectives rapidly and with minimal casualties. Computer modeling suggested to air planners it would take about a month of air attacks to destroy 75 to 80 percent of the armored vehicles, trucks, and artillery of the regular Iraqi army in Kuwait. Historical evidence shows attrition levels of 20 to 50 percent usually render a military force combat ineffective.

Another change from Instant Thunder was the decision to begin bombing the Republican Guards in southern Iraq at the start of Operation Desert Storm. The Secretary of Defense and CJCS identified the forces as the mainstay of the Iraqi defenses in the KTO, not only because they provided the bulk of Iraq's mobile reserves, but also because the regime counted on them to enforce the loyalty and discipline of the regular troops. In addition, weakening the Republican Guards would diminish Iraq's post-war threat to the region.

Given the SPG's small size, and the restrictions imposed by distance and limited communications, the director of campaign plans needed help. Checkmate augmented the SPG as an information fusion and analysis center; it provided an educated pool of manpower with face-to-face access to the national Intelligence Community. Instant Thunder had identified only 84 targets, but by January, intelligence experts and operations planners identified more than 600 potential targets, of which more than 300 became part of the CENTCOM strategic target list.

The planners in theater also received help from the Strike Projection Evaluation and Antiair Research (SPEAR) team of the Navy Operational Intelligence Center. SPEAR helped complete the picture of the Iraqi integrated air defense system (IADS), which used a mix of Soviet and Western equipment and concepts tied together by a C2 system largely designed by French technicians. Named Kari, this C2 system coordinated Iraqi air defense forces which could inflict severe Coalition losses. As part of a joint analysis with USAF and national agency participation, SPEAR helped identify the extent and nature of the threat, the key IADS nodes, and the importance of destroying those nodes early in the campaign.

On the basis of the joint analysis, in-theater modeling using the Command, Control, Communications, and Intelligence simulation model (provided by the USAF Center for Studies and Analysis and Headquarters USAF Plans and Operations) predicted low-altitude attacks on key leadership, Command, Control, and Communications (C3), and electrical targets in Baghdad would be extremely dangerous for both F-111F and A-6E aircraft. Consequently, these crucial targets were attacked from medium altitudes by F-117As and low altitudes by TLAMs. The SEAD effort to neutralize the Kari system proved vital to Coalition success; the initial

blow, according to intelligence reports, was one from which Iraqi air defenses never recovered.

At first, planners could rely on fewer than 75 long-range aircraft with a laser self-designation capability: 18 F-117As and 55 A-6Es. The mid-August decision to deploy 32 F-111Fs was the first major expansion in the laser-guided bombing capability. After the November decision to deploy additional forces, the number of aircraft so equipped increased to more than 200 F-117As, F-15Es, F-111Fs, and A-6Es.

Instead of having to make the first attack, return to base to rearm, refuel, and then make a second attack, the larger number of aircraft would strike about as many targets with a single wave. This increased the number of targets attacked almost simultaneously, complicated Iraq's air defense task, and increased aircraft availability for later strikes.

THE OPERATION DESERT STORM AIR CAMPAIGN PLAN

The plan was based on achieving the five military objectives listed below. These objectives were derived from the President's objectives and a planning model developed by the Air Staff's deputy director of plans for warfighting concepts. Below each objective are listed the target sets that would be attacked to secure the objective. (Although degrading a target set commonly would help achieve more than one goal, target sets are listed only once.)

JFACC Air Campaign Objectives

- Isolate and incapacitate the Iraqi regime:

- Leadership command facilities.
- Crucial aspects of electricity production facilities that power military and military-related industrial systems.
- Telecommunications and C3 systems.

- Gain and maintain air supremacy to permit unhindered air operations:

- Strategic IADS, including radar sites, SAMs, and IADS control centers.
- Air forces and airfields.

- Destroy NBC warfare capability:

- Known NBC research, production, and storage facilities.
- Eliminate Iraq's offensive military capability by destroying major parts of key military production, infrastructure, and power projection capabilities:
 - Military production and storage sites.
 - Scud missiles and launchers, production and storage facilities.
 - Oil refining and distribution facilities, as opposed to long-term production capabilities.
 - Naval forces and port facilities.
- Render the Iraqi army and its mechanized equipment in Kuwait ineffective, causing its collapse:
 - Railroads and bridges connecting military forces to means of support.
 - Army units to include RGFC in the KTO.

The Twelve Target Sets

The air campaign's 12 target sets are listed separately below. However, creating each day's attack plan was more complex than dealing with the target sets individually. The planners assessed progress toward the five military objectives, and how well they were accomplishing desired levels of damage and disruption, within each target set. The method for producing the daily attack plan involved synthesizing many inputs – battle damage assessment (BDA) from previous attacks, CINCCENT guidance, weather, target set priorities, new targets, intelligence, and the air campaign objectives. The target sets were interrelated and were not targeted individually. The available aircraft, special operations forces (SOF), and other assets then were assigned on the basis of ability and the most effective use of force.

Leadership Command Facilities

There were 45 targets in the Baghdad area, and others throughout Iraq, in the leadership command facilities target set. The intent was to fragment and disrupt Iraqi political and military leadership by attacking its C2 of Iraqi military forces, internal security elements, and key nodes within the government. The attacks should cause the leaders to hide or relocate, making it difficult for them to control or even keep pace with events. The target set's primary objective was incapacitating

and isolating Iraq's senior decision-making authorities. Specifically targeted were facilities from which the Iraqi military leadership, including Saddam Hussein, would attempt to coordinate military actions. Targets included national-level political and military headquarters and command posts (CPs) in Baghdad and elsewhere in Iraq.

Electricity Production Facilities

Electricity is vital to the functioning of a modern military and industrial power such as Iraq, and disrupting the electrical supply can make destruction of other facilities unnecessary. Disrupting the electricity supply to key Iraqi facilities degraded a wide variety of crucial capabilities, from the radar sites that warned of Coalition air strikes, to the refrigeration used to preserve biological weapons (BW), to nuclear weapons production facilities.

To do this effectively required the disruption of virtually the entire Iraqi electric grid, to prevent the rerouting of power around damaged nodes. Although backup generators sometimes were available, they usually are slow to come on line, provide less power than main sources, and are not as reliable.

During switch over from main power to a backup generator, computers drop off line, temporary confusion ensues, and other residual problems can occur. Because of the fast pace of a modern, massed air attack, even milliseconds of enemy power disruption can mean the difference between life and death for aircrews.

Telecommunications And Command, Control, And Communication Nodes

The ability to issue orders to military and security forces, receive reports on the status of operations, and communicate with senior political and military leaders was crucial to Saddam Hussein's deployment and use of his forces. To challenge his C3, the Coalition bombed microwave relay towers, telephone exchanges, switching rooms, fiber optic nodes, and bridges that carried coaxial communications cables. These national communications could be reestablished and so, required persistent restrikes. These either silenced them or forced the Iraqi leadership to use backup systems vulnerable to eavesdropping that produced valuable intelligence, according to DIA assessments, particularly in the period before the ground campaign.

More than half of Iraq's military landline communications passed through major switching facilities in Baghdad. Civil TV and radio facilities could be used easily for C3 backup for military purposes. The Saddam Hussein regime also controlled TV and radio and used them as the principal media for Iraqi propaganda. Thus, these installations also were struck.

Strategic Integrated Air Defense System

The Iraqi strategic IADS was one of the more important immediate target sets; before Coalition air power could exercise its full aerial bombardment potential, the effectiveness of Iraqi air forces and ground-based air defenses had to be reduced to negligible proportions. Targets included the mid- and upper-level air defense control centers, SAM sites, radar sites, and the C3 nodes that connected the system.

Air Forces And Airfields

The Iraqi Air Force posed both a defensive threat to Coalition air operations, and an offensive threat to Coalition forces in the region. In addition to a defensive capability, the Iraqi Air Force had a chemical weapons (CW) delivery capability and had used PGMs.

Initial targeting of the Iraqi Air Force during Operation Desert Storm emphasized the suppression of air operations at airfields by cratering and mining runways, bombing aircraft, maintenance and storage facilities, and attacking C3 facilities. Coalition planners anticipated the Iraqis initially would attempt to fly large numbers of defensive sorties, requiring an extensive counter-air effort. Air commanders also expected the Iraqis to house and protect aircraft in hardened shelters. An attempt to fly some aircraft to sanctuary in a neighboring country also was expected, although the safe haven was thought to be Jordan, rather than Iran.

Nuclear, Biological And Chemical Weapons Research, Production, And Storage Facilities

The extensive Iraqi NBC program was a serious threat to regional stability. Coalition planners intended to destroy weapons research and production capability and delivery vehicles. Because of the Iraqis' elaborate efforts to hide the extent of their programs, Coalition forces were uncertain of their exact scope.

Intelligence estimates varied, but the planning assumption was that Iraq could produce a rudimentary nuclear weapon by the end of 1992, if not sooner. Throughout the planning period, and during the conflict, finding and destroying NBC weapons facilities remained a top priority. International investigations continue to reveal the advanced character of Iraq's nuclear program, and to uncover additional facilities. The existence of the Al-Athir complex, 40 miles south of Baghdad, which was reported lightly damaged by bombing, was not confirmed until late in the war. It was the target of the last bomb dropped by an F-117A in the conflict.

Scud Missiles, Launchers, And Production And Storage Facilities

Iraq's Scud missile capability was considered a military and a psychological threat to Coalition forces, a threat to civilian populations in Israel, Saudi Arabia, and some other Gulf countries, and a threat to long-term regional stability. Along with targeting the fixed launch sites in western Iraq, Coalition planners targeted Iraq's ability to deploy existing missiles and build more.

Intelligence estimates at the time of the total numbers of mobile launchers and Scuds were sketchy and proved to be too low. As a working estimate, planners used 600 Scud missiles (and variants), 36 mobile launchers, and 28 fixed launchers in five complexes in western Iraq, plus some training launchers at At-Taji. Initial attacks concentrated on eliminating the fixed sites. Plans were developed for hunting and destroying mobile Scud launchers, but the missiles would prove to be elusive targets.

Naval Forces And Port Facilities

Although Iraq was not a major naval power, its naval forces posed a threat to Coalition naval and amphibious forces, and sealift assets. Iraqi forces had Silkworm and Exocet antiship missiles and mines; they could create a substantial political and military problem by destroying or seriously damaging a major surface ship. Coalition planners targeted Iraqi naval vessels, including captured Kuwaiti Exocet-equipped patrol boats, port facilities, and antiship missiles to prevent interference with Coalition operations and to reduce the threat to friendly ports and logistical systems in the Persian Gulf.

Oil Refining And Distribution Facilities

Fuel and lubricants are the lifeblood of a major industrial and military power. Iraq had a modern petroleum extraction, cracking, and distillation system, befitting its position as one of the world's major oil producing and refining nations. Coalition planners targeted Iraq's ability to produce refined oil products (such as gasoline) that had immediate military use, instead of its long-term crude oil production capability.

Railroads And Bridges

Most major railroad and highway bridges in Iraq served routes that ran between Baghdad and Al-Basrah. Iraqi forces in the KTO were almost totally dependent for their logistical support on the lines of communication (LOCs) that crossed these bridges, making them lucrative targets. Although Iraqi forces had built large stockpiles of supplies in southeast Iraq by January, DIA reported cutting the bridges prevented or reduced restocking, and prevented reinforcement of deployed forces once the air campaign began.

Iraqi Army Units Including Republican Guard Forces In The KTO

Iraq's means of projecting power into Kuwait and against the Coalition centered on its ground forces deployed in the KTO, especially its best units, the Republican Guard. Although Iraqi forces were dug into strong positions built to defend against ground attack, they were vulnerable to air attack. Coalition planners hoped to reduce the combat effectiveness of these forces in the KTO by about 50 percent before the ground offensive.

Military Storage And Production Sites

The long-term combat effectiveness of Iraq's large military forces depended on military production facilities and continued support from its logistical base. Destruction of repair facilities, spare parts supplies, and storage depots would degrade Iraq's combat capability and long-term threat to the region. Planners knew there were too many targets to be eliminated entirely. For example, there were seven primary and 19 secondary ammunition storage facilities alone identified on target lists; each was composed of scores of individual storage bunkers. Consequently, they planned first to destroy the most threatening production facilities and stored materiel, then methodically to proceed with attacks on other storage and production facilities as time and assets allowed.

Constraints on the Concept Plan

Avoid Collateral Damage And Casualties

A key principle underlying Coalition strategy was the need to minimize casualties and damage, both to the Coalition and to Iraqi civilians. It was recognized at the beginning that this campaign would cause some unavoidable hardships for the Iraqi people. It was impossible, for example, to shut down the electrical power supply for Iraqi C2 facilities or CW factories, yet leave untouched the electricity supply to the general populace. Coalition targeting policy and aircrews made every effort to minimize civilian casualties and collateral damage. Because of these restrictive policies, only PGMs were used to destroy key targets in downtown Baghdad in order to avoid damaging adjacent civilian buildings.

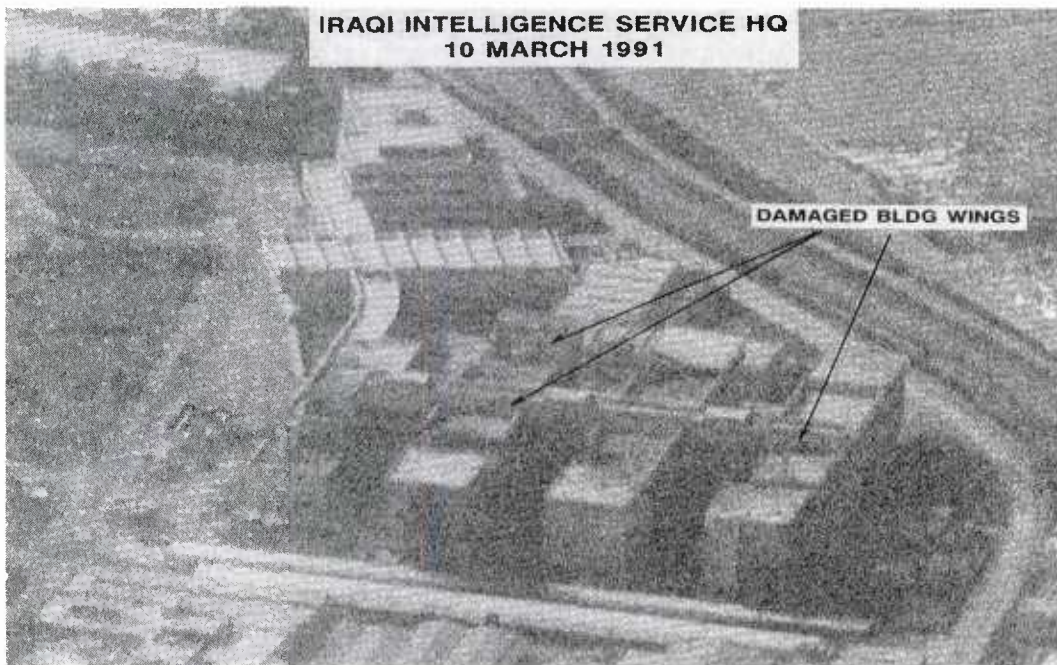
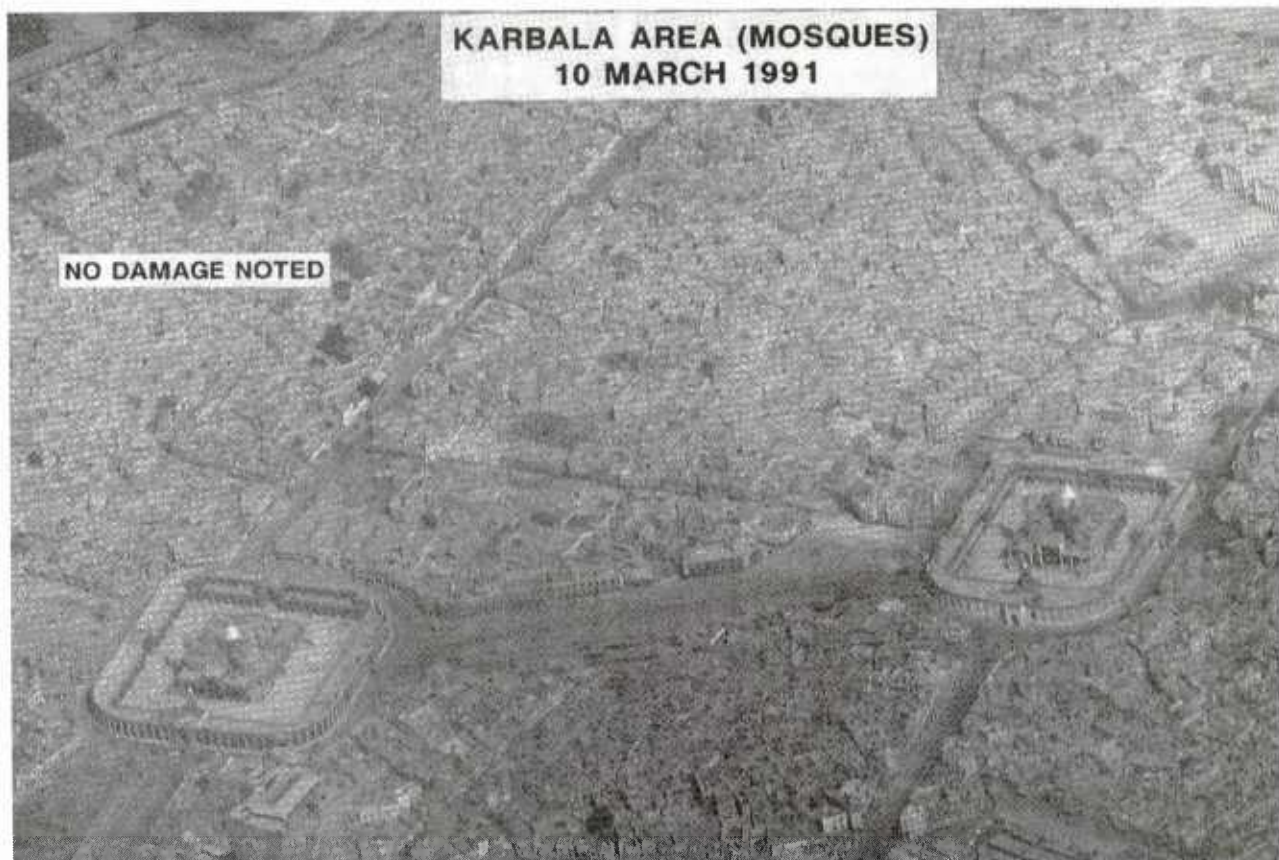


Figure VI-2

Coalition Targeting Policy Was to Minimize Collateral Damage and Civilian Casualties. Using Precision Weapons, Targets Such as the Iraqi Intelligence Service Headquarters in Baghdad were Struck Usually with Little or No Damage to Adjacent Buildings, According to Post-war Intelligence Assessments



*Figure VI-3
Areas of Historical or Cultural Significance Were Not Targeted. Mosques Were
Among the Targets on the Off-Limits List.*

Off Limits Targets

Planners were aware that each bomb carried a potential moral and political impact, and that Iraq has a rich cultural and religious heritage dating back several thousand years. Within its borders are sacred religious areas and literally thousands of archaeological sites that trace the evolution of modern civilization. Targeting policies, therefore, scrupulously avoided damage to mosques, religious shrines, and archaeological sites, as well as to civilian facilities and the civilian population. To help strike planners, CENTCOM target intelligence analysts, in close coordination with the national intelligence agencies and the State Department, produced a joint no-fire target list. This list was a compilation of historical, archaeological, economic, religious and politically sensitive installations in Iraq and Kuwait that could not be targeted. Additionally, target intelligence analysts were tasked to look in a six-mile area around each master attack list target for schools, hospitals, and mosques to identify targets where extreme care was required in planning. Further, using imagery, tourist maps, and human resource intelligence (HUMINT) reports, these

same types of areas were identified for the entire city of Baghdad. When targeting officers calculated the probability of collateral damage as too high, the target was not attacked.

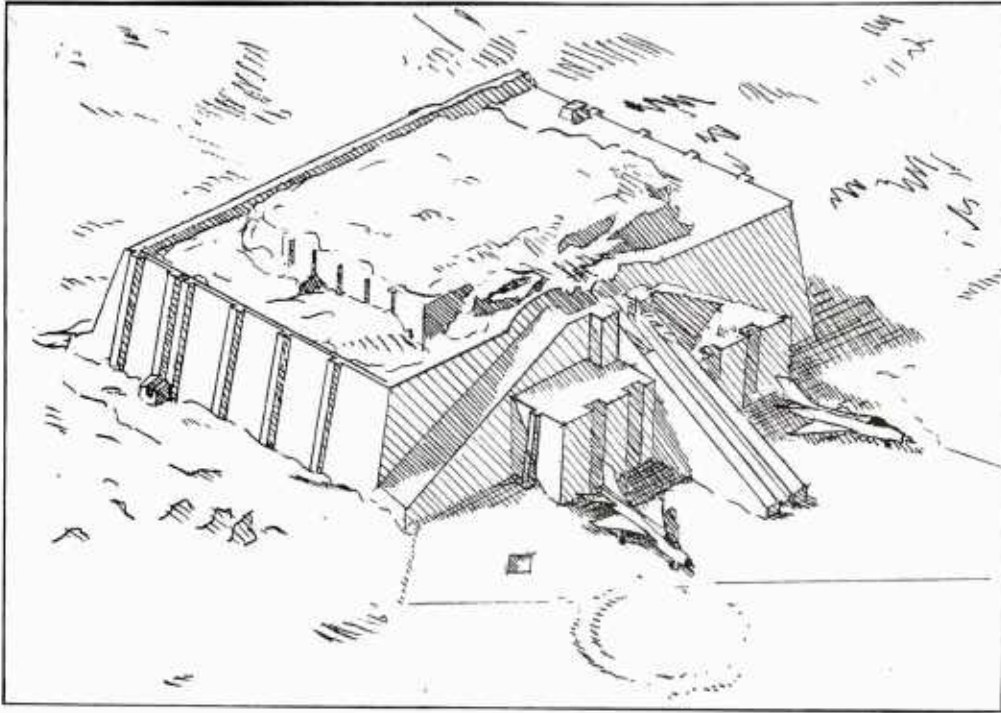


Figure VI-4

The Ancient Temple Depicted in This Painting was not Targeted Despite the Placement of Iraqi Fighter Aircraft Nearby.

Only when a target satisfied the criteria was it placed on the target list, and eventually attacked based on its relative priority compared with other targets and on the availability of attack assets. The weapon system, munition, time of attack, direction of attack, desired impact point, and level of effort all were carefully planned. For example, attacks on known dual (i.e., military and civilian) use facilities normally were scheduled at night, because fewer people would be inside or on the streets outside.

Phased Execution

CINCCENT planners estimated that, with good weather and a specified level of effort, Phases I-III would last approximately 18 days. The main attacks of Phase I, the

Strategic Air Campaign, would last about six days; a lower level of effort, against strategic targets, would continue throughout the remainder of the war to maintain pressure inside Iraq, to reattack targets not previously destroyed, and to attack newly discovered targets. The concentrated Phase II effort to establish air superiority over the KTO would last approximately one day; as was true for Phase I, a lower level of effort would continue to keep enemy air defense suppressed. Phase III, designed to reduce Iraqi combat effectiveness in the KTO by half, was to begin near the end of the Phase II SEAD effort and was expected to complete its objectives in about 10 to 12 days. Phase III attacks would continue until the President directed the start of the Offensive Ground Campaign. During Phase IV of Operation Desert Storm, air operations were designed to support the ground maneuver scheme by flying interdiction, battlefield air operations, and close air support (CAS) sorties. Interdiction would continue against enemy artillery, rockets, and reserve forces throughout the KTO. There was some planned overlap of the phases (Table VI-1).

Estimated Theater Campaign Phase Lengths

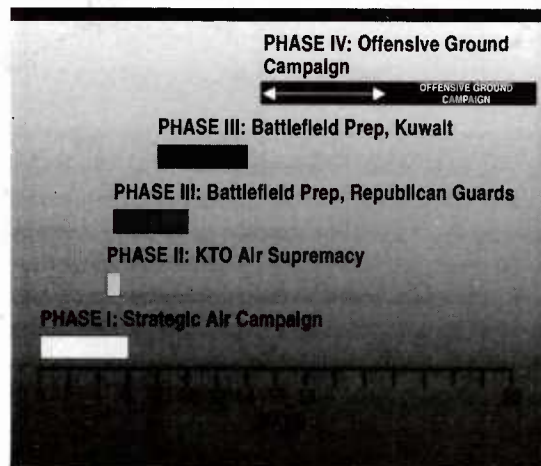


Table VI-1

The original sequential air campaign execution was designed to reduce the threat to Coalition aircraft conducting Phase III, the systematic reduction of the Iraqi military forces in the KTO. With the increased amount of Coalition air power available in January, CINCCENT merged the execution of Phases I - III so Operation Desert Storm would begin with air attacks throughout the theater against the most crucial targets in each phase.

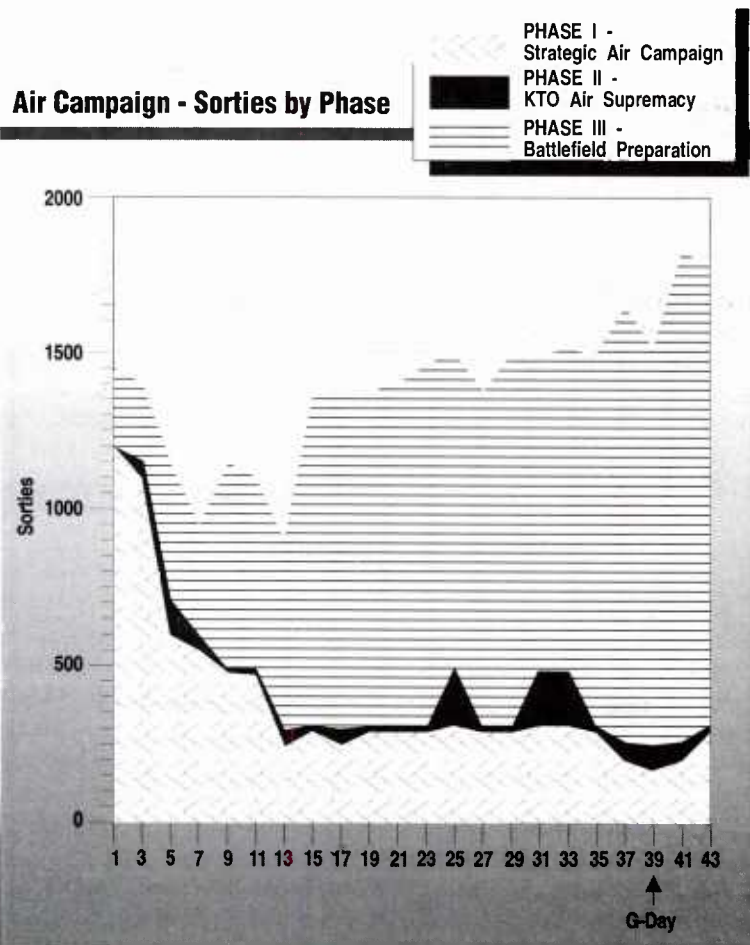


Table VI-2
*Air Campaign Coalition Combat Sorties by Phase –
 Actual Execution Note: Phase IV Aircraft Sorties
 Are Included in Phase III Sortie Depiction*

The predicted phase lengths were planning guidelines. CINCCENT built the Phase IV Offensive Ground Campaign plan on the assumption that air power alone would reduce Iraqi combat effectiveness in the KTO by about half. If all went as planned, Saddam Hussein and his forces in the Kuwait theater would be immobilized – unable to coordinate an effective defense, or to plan and execute large-scale counter offensives. Continued attacks and restrikes would maintain desired levels of disruption. If the Offensive Ground Campaign became necessary, it would be fought on Coalition terms. There would not be months of fighting and thousands of casualties as some had predicted, or as Saddam Hussein hoped. The ground offensive would last only days and Coalition casualties would be lighter. Together, the air and ground campaigns would ensure destruction of the Iraqi army's offensive capability, and the Coalition's success. Referring to the Iraqi Army in the KTO, the CJCS said in January, "First we're going to cut it off; then we're going to kill it."

PREPARING TO EXECUTE THE PLAN

The Joint Forces Air Component Commander

The historical problem of fragmented air operations command was solved when the CINCCENT operations order (OPORD) assigned the CENTAF Commander as the JFACC, responsible for planning the air campaign, and coordinating, allocating, and tasking apportioned Coalition air sorties to meet the theater objectives.

Although this concept had been used at least as early as World War II, Operation Desert Storm was the first regional conflict in which the JFACC was established formally. The concept proved its value; JFACC planned, coordinated, and, based on CINCCENT's apportionment decision, allocated, and tasked the efforts of more than 2,700 Coalition aircraft, representing 14 separate national or Service components. He integrated operations into a unified and focused 43-day air campaign using the master attack plan (MAP) and the air tasking order (ATO) process, which provided the necessary details to execute the attack.

The Master Attack Plan

The JFACC's intent for the air campaign was set forth in the MAP and the more detailed document derived from it, the ATO. The MAP was the key JFACC internal planning document which consolidated all inputs into a single, concise plan. CINCCENT had identified the crucial enemy elements or centers of gravity which had to be attacked effectively to achieve the President's stated objectives. From these centers of gravity, planners identified the Iraqi targets sets and, with the help of intelligence from a variety of agencies and institutions, set out to identify and locate the crucial nodes as well as those making up the bulk of the targets in each set. Using the concept of a strategic attack – striking directly at each target set's crucial nodes – the initial attack plan was developed. It focused on achieving desired effects appropriate to each target set rather than each target. As a subset of the CENTCOM joint target list, a JFACC master strategic target list was developed using a target reference number system based on the initial 12 target categories. However, the MAP did not merely service the target lists; it required timely analysis of BDA, and reflected changing target priorities, and other political and combat developments.

MAP preparation reflected a dynamic JFACC process in which strategic decision making was based on objectives, CINCCENT guidance, target priorities, the desired effect on each target, a synthesis of the latest multi-source intelligence and analysis, operational factors such as weather, the threat, and the availability and suitability of strike assets. In putting together the MAP, the best weapon system to achieve the desired effect was selected – regardless of Service or country of origin – and requested by the JFACC through CINCCENT if not already available in theater.

Force packages were built to exploit enemy weakness and Coalition advantages (e.g., night operations, stealth, PGMs, cruise missiles, drones, attack helicopters, SOF, and airborne refueling).

The result was a relatively compact document (the first day's MAP was only 21 pages) that integrated all attacking elements into force packages and provided strategic coherency and timing to the day's operations. It consisted of the sequence of attacks for a 24-hour period and included the time on target, target number, target description, number and type of weapon systems and supporting systems for each attack package. The MAP drove the process.

The Air Tasking Order

The ATO was the daily schedule that provided the details and guidance aircrews needed to execute the MAP. Through a laptop computer, it meshed the MAP with the air refueling plan. Weapon system experts from the JFACC staff and field units worked together with intelligence, logistics, and weather experts to add such details as mission numbers, target identification, and, sometimes, ordnance loads to the MAP. The weapon system experts included representatives from all of the Services, the RAF, the RSAF and, during the war, other Coalition air forces based on their degree of participation. Service and Coalition representatives served both as planners and as liaisons to their component or national staffs. Target assignments, route plans, altitudes, refueling tracks, fuel offloads, call signs, identification friend or foe codes, and other details were allocated for every Coalition sortie.

The ATO was a two-part document. The first focused on targeting and mission data and EW/SEAD support. The second contained the special instructions on topics such as communications frequencies, tanker and reconnaissance support, Airborne Warning and Control System (AWACS) coverage, combat search and rescue (CSAR) resources, routes into and out of enemy airspace, and many other details. If they did not adhere strictly to the ATO, Coalition air forces risked air-to-air and surface-to-air fratricide, inadequate fighter and SEAD support, or inadequate tanker support to reach the target and return safely. The ATO allowed C2 elements to orchestrate combat and support operations. C2 elements such as the land-based Tactical Air Control Center (TACC), EC-130 Airborne Battlefield Command and Control Center (ABCCC), AWACS and E-2Cs functioned more effectively and efficiently because the ATO provided a single attack script. While including Navy aircraft flights into Kuwait or Iraq, the ATO excluded Navy sorties over water. It tasked some aircraft originating outside the CENTCOM AOR, such as B-52s based in Spain, England, and the continental United States (CONUS).

Incorporating the closehold, offensive air campaign ATO into the normal planning process was challenging. During the planning phase for Operation Desert Storm, all the information was loaded into a laptop computer in the SPG, carried to

the CENTAF ATO division in the middle of the night, and connected to heavy duty printers used for the daily training ATOs. When the hundred-page-plus ATOs were printed, they were carried back to the SPG where they were reviewed for accuracy, packaged, transmitted electronically by secure channels, flown around the theater, and delivered to units that were to participate in the air campaign. As the enemy situation changed, the MAP and the ATO were refined continuously.

The ATO was very effective and successful, particularly for the initial, preplanned stages of the Strategic Air Campaign. However, the ATO did not respond as rapidly when air operations progressed and emphasis shifted to more mobile targets. This was caused by a lengthy planning cycle, the size and perceived complexity of the ATO, and dissemination delays caused by some forces' not having compatible equipment. In addition, the ATO planning cycle was out of phase with available BDA. Target selection and planning often were nearly complete before results of the previous missions were available. Plans were developed to use kill boxes, strip-alert aircraft, and uncommitted sorties in the ATO to ensure ATO execution flexibility and operational responsiveness.

TRANSITION TO WARTIME PLANNING

As the offensive approached, the JFACC merged his special-access planning program with the rest of his headquarters. The JFACC's director of air campaign plans (DCP) determined the SPG's compartmented nature was too cumbersome and that the planning process should be part of the daily ATO processing and execution cycle.

An early January SPG reorganization satisfied that need by consolidating several planning functions to establish the Guidance, Apportionment, and Targeting Division (GAT). The Black Hole became the Iraqi Strategic Planning Cell – primarily responsible for the Strategic Air Campaign. It functioned as before in creating the MAP, but no longer was responsible for the mechanics of ATO processing and distribution. The JFACC combat operations plans division became the KTO Planning Cell – primarily responsible for direct attack on Iraqi forces in the KTO. Planning cells for electronic combat, counter-Scud and NBC attack planning, ARCENT ground operations liaison, and an analysis cell, rounded out the GAT staff.

The DCP also was given responsibility for the ATO division, as well as the Airborne Command Element division, whose officers flew on board AWACS and helped control the air war. The DCP's responsibilities, therefore, encompassed planning, processing, and part of execution, with some people from every function participating in every other function. This organizational structure made it easier to carry the strategic focus of the air campaign from the MAP through the ATO to the AWACS mission director's console.

When the air offensive began, the DCP divisions began to operate on a 24-hour basis. The process began with CINCCENT guidance for adjustments to the air campaign plan passed through the JFACC 0700 staff meeting. Based on this guidance, the chief planners of the Iraqi/KTO planning cell created the MAP, which was approved by the DCP by 2000 that same day. Once approved, it was given to the intelligence division for aimpoint selection and verification for some specified targets. In other cases, planners and Navy, USMC, and RAF units selected aimpoints. Additional planning cell members transferred the MAP onto target planning worksheets (TPWs) and added details such as mission numbers required for processing the MAP into an ATO.

At 0430 the next day the TPWs were delivered to the ATO division, which worked out the details required to make the plan an executable ATO (e.g., airspace deconfliction, tanker routing, identification squawks, and special operating instructions). This information was then entered into the computer-aided force management system (CAFMS). Between 1700 and 1900, the final ATO was completed and sent to those units equipped to receive it electronically. The execution day the ATO covered began the next morning.

Three wars were going on each day – the execution war of today; the ATO building for tomorrow's war; and the MAP for the day-after-tomorrow's war. Weather, slow and limited BDA, the implications of Scud attacks and associated shifting of resources eventually compressed the three-day process into two. As a result, planners assumed more of the current operations tasks, improvised to work around BDA shortcomings, and developed a system to track the multitude of adjustments and changes to avoid unnecessary restrikes.

The ATO was much larger than the MAP, often more than 300 pages of text, and there were difficulties disseminating it. To transmit the ATO, the USAF deployed an existing electronic system, CAFMS, an interactive computer system for passing information that allows online discussion between the TACC combat operations section and combat units. CAFMS transmitted the ATO and real-time changes to most land-based units. However, CENTAF had problems using CAFMS to transmit the ATO to some B-52 units and aircraft carriers, in large part because of the complexity of the satellite relays to units outside the peninsula. Some problems were solved by extending CENTCOM's tactical super-high frequency satellite communications (SATCOM) network to include B-52 bases. After the MAP was written, planners rarely changed Navy sorties because of planning and communications concerns. Initially, this limited the flexible use of Navy air assets and resulted in USAF and USMC land-based air assigned to most short-notice changes.

The ATO reflects the USAF philosophy and practice for attack planning. The USAF focused on the potential for large-scale theater war and developed a system that allowed an orderly management of large numbers of aircraft. Because USAF doctrine separates intelligence, targeting, and flying functions, the ATO was designed to provide mission commanders with detailed direction about many aspects of the mission (including the target, weapon type, and strike composition, but not tactics).

Navy JFACC planning staff members provided targeting data before ATO dissemination through the Fleet satellite command net, and secure voice satellite telephone (INMARSAT). The Navy ultimately found the best way to distribute the final ATO and any strike support graphics and photos to the carriers was to use an S-3 aircraft or a courier. There were acknowledged difficulties with the mechanics of disseminating the ATO because of the lack of interoperability between the carriers' data systems and CAFMS. Nevertheless, it would have been impossible to achieve the air campaign's success and conduct combat operations as they were fought without the MAP and ATO.

Planners built flexibility and responsiveness into operations by delegating most detailed mission planning to the wing and unit level. Some aircraft were held in reserve or placed on ground alert to allow quick response to combat developments, Scud launches or missile transporter sightings, convoys or troop movements, and newly discovered targets. Many aircraft were assigned to generic or regional target locations, such as kill boxes in the KTO, where they might receive detailed attack instructions from air controllers. Most aircraft had alternate targets that allowed flexible response to changes in weather or other developments in the tactical situation.

At the beginning of Operation Desert Shield force deployment, there essentially was no existing US military command, control, communications, and computer (C4) infrastructure in the region. By mid-January, the Coalition had established the largest tactical C4 network ever assembled. This network provided for the C2 of forces, dissemination of intelligence, establishment of an in-theater logistics capability and for myriad other combat service support activities such as personnel, finance, and EW. Despite this effort, the start of Operation Desert Storm made it clear the requirement for communications outstripped the capacity. This was especially true for the large amounts of imagery and intelligence data bases that needed to be transmitted throughout the theater. These products required large bandwidth capacity circuits for transmission. The available circuits simply were not able to handle the magnitude of data.

The Fleet pursued several initiatives to relieve some overloaded military circuits. One of the more effective innovations was use of INMARSAT to help with tactical communications. INMARSAT proved to be a vital link for coordinating the efforts of NAVCENT in the *USS Blue Ridge* (LCC 19) and staff elements in Riyadh, for communicating directly with CINCCENT, and for coordinating ATO inputs with the Persian Gulf battle force commander in *USS Midway*. (A discussion of C3 is found in Appendix K.)

Deception

CENTCOM deception helped achieve the tactical surprise that set the stage for defeat of Iraq. A visible pattern of round-the-clock air activity was established as part of the overall deception plan. Placement of air refueling tracks and training areas emphasized support for a frontal assault against entrenched Iraqi defenses that helped CINCCENT play on Iraqi beliefs about Coalition intentions.

The Iraqis were conditioned to the presence of large numbers of AWACS and fighter combat air patrols (CAPs) on the borders with Saudi Arabia and the Persian Gulf. These aircraft flew defensive missions in the same orbits and numbers that would be used for the air offensive. A series of surges began to create a pattern of increased activity one night a week.

The final preparations for Operations Desert Storm were masked by placing many aircraft on ground alert. The published reason was as a precaution against a pre-emptive Iraqi attack before the 15 January UN deadline. The true reason was to permit mission planning, crew rest, and aircraft reconfigurations without revealing the Coalition's actual intentions. Ground alert weapons loads matched the loads listed in the ATO for the attack. However, F-15s flew daily operational CAP missions within EW coverage and could not stand down without leaving Saudi airspace unprotected and raising Iraqi suspicions. To maintain the desired Iraqi perception of routine Coalition operations, but also allow F-15 units to make final preparations, F-16s not involved in the first attack were tasked to fill the defensive gaps. These and other Coalition deception efforts helped apply the principle of surprise in warfare.

ON THE EVE OF THE AIR WAR

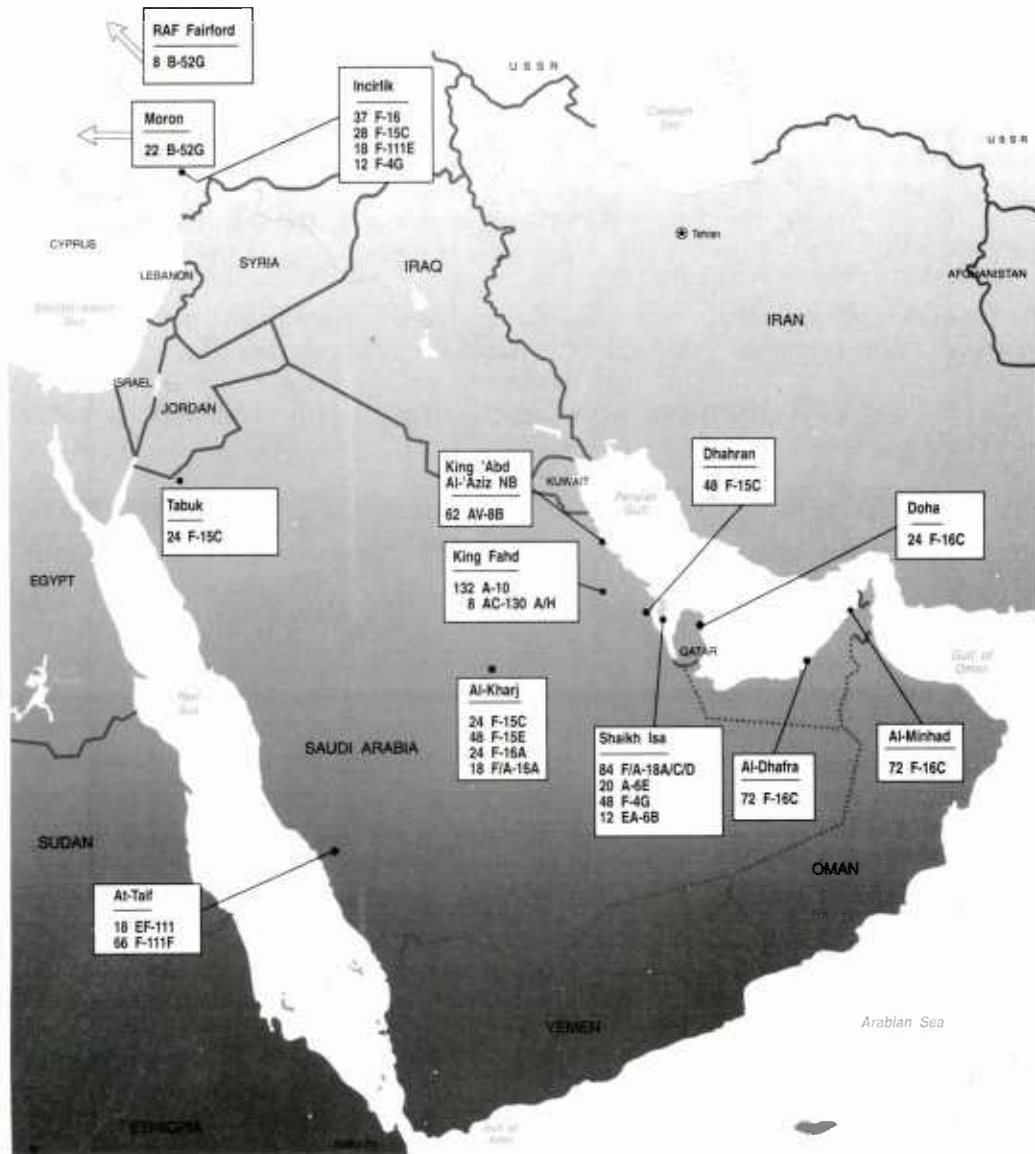
Disposition of Air Forces

At the beginning of Operation Desert Storm, there were 2,430 fixed-wing aircraft in theater, just more than one quarter of which belonged to non-US Coalition partners. Thirty-eight days later, G-Day, that number had grown by more than 350. Approximately 60 percent of all aircraft were shooters, producing a relatively high tooth-to-tail ratio in the theater.

CENTAF

USAF aircraft were bedded down throughout Saudi Arabia and the other Gulf states, initially depending on where they could be received; relocations were based

(Land-Based Fixed-Wing Only As of 24 Feb 91)

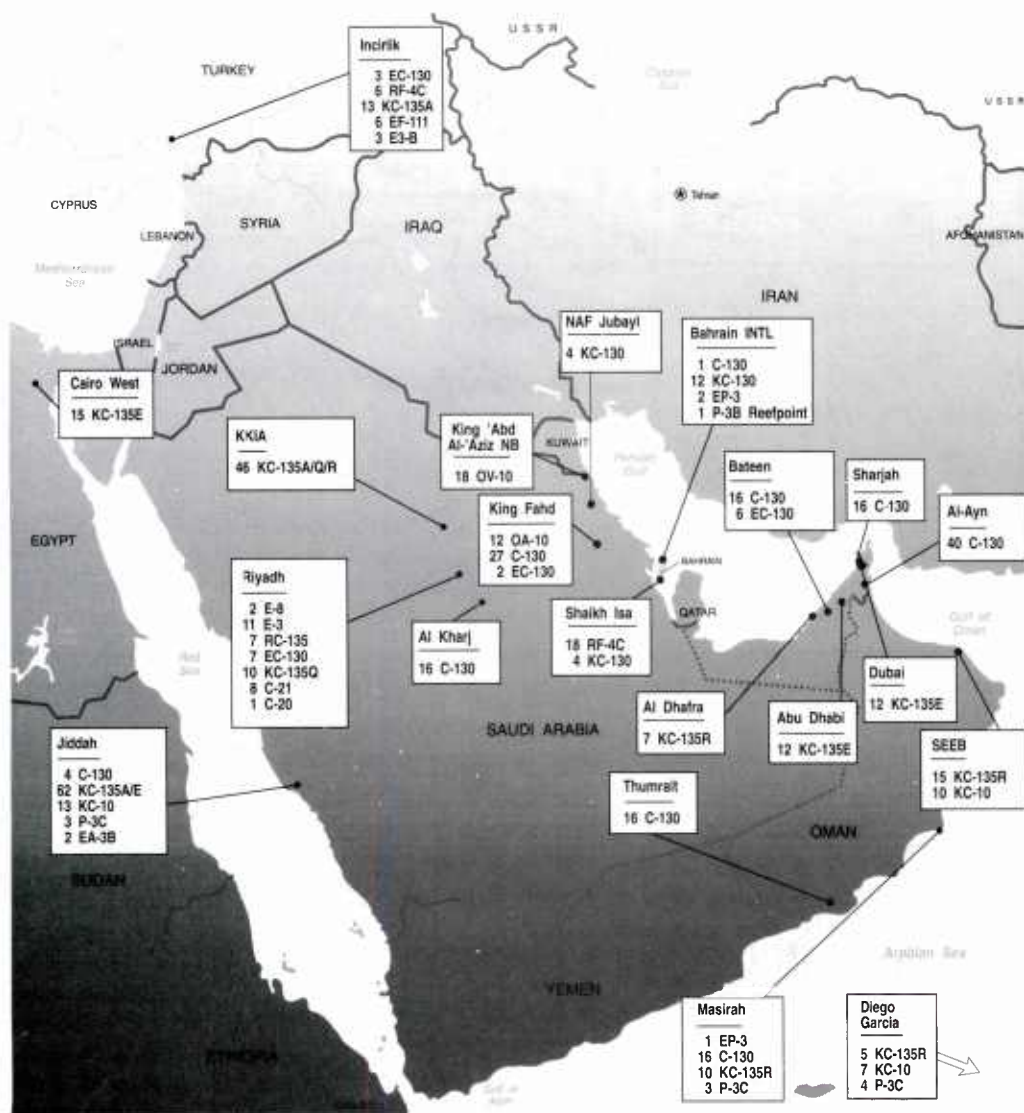


Map VI-1
Coalition Land-Based "Shooters" on 24 February. Note:
Aircraft Numbers and Locations Changed Continuously.

primarily on each aircraft's role in Operation Desert Storm. Some tanker assets, as well as unique reconnaissance platforms such as the TR-1s, and U-2s, and specialized combat aircraft such as the F-117As, EF-111s, and F-111Fs, were based at installations near Saudi Arabia's Red Sea coast. This increased security by keeping them well away from areas that could be reached by a sudden Iraqi pre-emptive strike. It also let them practice and refine most tactics outside of Iraqi radar range.

US AOB "SUPPORT"

(Land-Based Fixed-Wing Only As of 24 Feb 91)



Map VI-2

Coalition Land-Based Support Aircraft on 24 February. Note: Aircraft Numbers and Locations Changed Continuously.

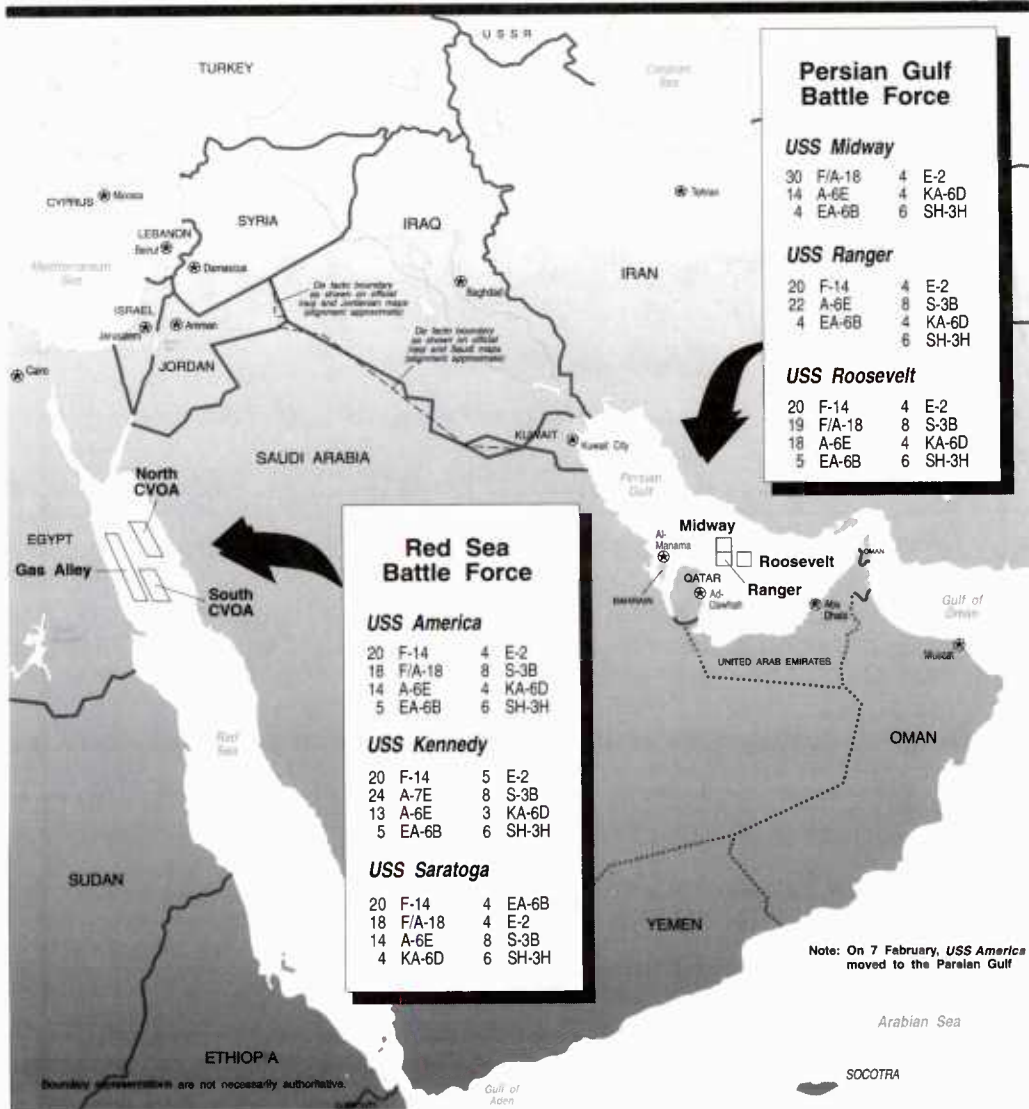
Air superiority fighters, such as the F-15C, and air-to-ground aircraft, such as the F-15E, were based relatively close to the Iraqi border, where they had the greatest reach and were near long-duration CAP stations over Iraq. Finally,

[illegible]

*US Conventional Rotary-Wing Aircraft Beddown on 16 January.
Note: Aircraft Numbers and Locations Changed Continuously.*

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Operation Desert Storm Carrier Operating Areas - 21 January 1991



Map VI-4

Carrier Operating Areas and Aircraft Status on 21 January. Note: Aircraft Locations and Numbers Changed Frequently.

NAVCENT

The operating areas of the aircraft carrier battle forces at the beginning of Operation Desert Storm are shown on Map VI-4. The *USS John F. Kennedy* (CV 67), *USS Saratoga* (CV 60), and *USS America* (CV 66) battle groups operated in the Red Sea while the *USS Midway* (CV 41), *USS Ranger* (CV 61), and *USS Theodore Roosevelt*

(CVN 71) battle groups operated in the Persian Gulf. *USS America* left the Red Sea on 7 February and arrived in the Gulf on 15 February to provide more air support for ground forces in the ground offensive. Typically, with three carriers present in the Red Sea early in the war, one carrier operated in a northern station and one in a southern station while the third replenished fuel and ammunition to the west.

In addition to the six carrier air wings, other Navy air assets in theater supported the Coalition effort. EP-3 and EA-3B aircraft conducted EW missions to support the strike offensive, while the P-3Cs conducted extensive reconnaissance, supporting maritime strike and Coalition maritime intercept operations.

MARCENT

In keeping with a Naval expeditionary posture, USMC aircraft were based both on amphibious ships in the Gulf and at bases ashore. The main operating bases ashore for 3rd Marine Aircraft Wing (MAW), the I Marine Expeditionary Force (MEF) aviation combat element, were at Shaikh Isa, Bahrain, and at Al-Jubayl Naval Air Facility and King 'Abd Al-'Aziz Naval Base, Saudi Arabia. Marine Aircraft Group (MAG) 11, based in Bahrain, was equipped with F/A-18A, C and D aircraft as well as A-6E, EA-6B and KC-130 aircraft. MAG 16 and MAG 26, the helicopter groups, initially were at Al-Jubayl with CH-46, CH-53, AH-1, and UH-1 aircraft. Later, before the beginning of Operation Desert Storm, some helicopters were forward based at Al-Mishab to support the forward movement of I MEF. MAG 13 (Forward) was at King 'Abd Al-'Aziz Naval Base, with AV-8Bs and OV-10s. The AV-8Bs and OV-10s were the most forward land-based fixed-wing aircraft of any Service. Forward bases for both fixed- and rotary-wing aircraft also were established at various locations throughout the theater. Three locations were Tanajib, an ARAMCO facility 35 miles south of the Kuwait border, Al-Mishab, 28 miles south of the border, and Lonesome Dove, a logistics support base in the Saudi desert, also near the border. Marine Air Control Group (MACG) 38 provided the Marine Tactical Air Command Center, an alternate Tactical Air Command Center, a ground-based Direct Air Support Center (DASC), a DASC Airborne (DASC-A) in a KC-130, a Tactical Air Operations Control Center, an associated early warning/control site, two I-HAWK missile battalions, and two Stinger anti-aircraft battalions.

Marine aircraft also were positioned on amphibious ships in the Persian Gulf as part of the Amphibious Task Force (ATF) under NAVCENT. MAG 40, the 4th Marine Expeditionary Brigade (MEB) aviation combat element, had arrived in the Gulf in September. Its aviation assets included fixed-wing and rotary-wing aircraft (20 AV-8Bs, 24 CH-46s, 14 CH-53s, 6 UH-1Ns, and 15 AH-1s). The 13th MEU (SOC), under the operational control of 4th MEB, had an additional 12 CH-46s, four CH-53s, four AH-1s, and two UH-1Ns. In January, the 5th MEB arrived in the Gulf, bringing an additional six AV-8Bs, 24 CH-46s, four CH-53s, 12 UH-1Ns, and 20 AH-1s to the ATF. The 5th MEB joined the 4th MEB, forming a major amphibious force that included 31 ships and more than 17,000 Marines and sailors in the landing force.

Joint Task Force Proven Force

During the first few weeks after the Iraqi invasion of Kuwait, Headquarters United States Air Forces Europe (USAFE) planners developed a concept to base EW support at Incirlik Air Base, Turkey. They envisioned complicating Iraqi defensive efforts by diverting attention electronically. The proposal eventually was endorsed by European Command (EUCOM) and the CJCS. The proposal was briefed to the Turks and discussions regarding authorization began.

Meanwhile, USAFE began to form the force package that eventually would coalesce at Incirlik as Joint Task Force (JTF) Proven Force, a composite wing (similar in concept to a Navy carrier air wing) of reconnaissance, fighter, bomber, tanker, EW, and C3 aircraft. The Commander-in-Chief Europe (CINCEUR) and CINCCENT agreed that while EUCOM would retain operational control, CENTCOM would exercise tactical control and provide targeting requirements and tactical direction.

On 21 December, the CINCEUR Crisis Action Team telefaxed an advance copy of the preliminary JTF Proven Force OPOrd to Headquarters USAFE. Two days later, on 23 December, CINCEUR sent Headquarters USAFE the formal OPOrd message. The CINCEUR OPOrd tasked USAFE to appoint a JTF commander in the rank of major general, establish a staff to support the JTF commander, and coordinate air refueling, strike planning, and mission execution activities.

The first contingent of 39 JTF Proven Force headquarters personnel deployed from Ramstein Air Base, Germany, and arrived at Incirlik Air Base on 16 January. The next day, the Turkish Parliament empowered the Turkish government to use "those forces previously authorized (e.g. foreign military [forces] brought to Turkey since the Gulf Crisis) at the time and in the manner the government deems appropriate to carry out UN Security Council resolutions." The Turkish General Staff's rapid coordination and approval of airspace control, safe passage procedures, and air refueling tracks facilitated JTF Proven Force's entry into the air war.

JTF Proven Force was a powerful group of aircraft that included F-15s for air cover; F-16s for day strike; F-111Es for night strike; EF-111s, EC-130s and F-4Gs for EW and SEAD; KC-135s for aerial refueling; RF-4s for reconnaissance; and E-3Bs for airborne surveillance and C3.

To reduce the amount of detailed communication required between Riyadh and Incirlik, JTF Proven Force missions were planned as part of the MAP, but their tasking was not as detailed, and in some cases was similar to mission type orders, which provide broad guidance on an expected outcome, such as, "Destroy CW production facilities at Mosul." JTF Proven Force planners were assigned targets on the master target list and then determined force size, mix, and desired weaponry – details normally included in ATO taskings for most other units. Their relative geographical isolation in northern Iraq allowed them to operate semi-autonomously, and the amount of coordination they required with mission packages from other Coalition air forces was limited. JTF Proven Force conducted

most of its operations north of At-Taji. This was primarily because its location allowed aircraft to reach targets in northern Iraq more readily than could the forces based in Saudi Arabia.

Once Operation Desert Storm began, B-52s deployed to Moron Air Base, Spain, came under EUCOM control and sometimes flew missions coordinated with JTF Proven Force. Later, more B-52s deployed to RAF Fairford, United Kingdom. The decision to fly bombing missions from this location came after approval was granted to fly over French territory carrying conventional weapons. Once bombers based at Fairford began flying in support of JTF Proven Force, bombers at Moron switched to targets near the southern Iraq/Kuwait border under CENTCOM control.

Other EUCOM forces deployed to Turkey as well. On 12 January, the Secretary of Defense authorized the deployment of two EUCOM Patriot batteries from Dexheim, Germany, to Turkey to provide air defense for Incirlik Air Base. By 22 January, six of the eight launchers and 43 missiles were in place and operational.

Non-US Forces

A large contingent of the North Atlantic Treaty Organization's Allied Command, Europe, Mobile Forces (Air) deployed to Turkey to deter an Iraqi attack. Eighteen Luftwaffe Alpha Jets deployed with approximately 800 personnel. Three German reconnaissance aircraft also arrived with about 125 support personnel.

The non-US Coalition partners made a valuable contribution to the success of the air campaign through diplomatic, logistic, and operational support. Some partners who, for various reasons, did not send air forces, provided overflight or basing rights which made support of the effort in theater possible.

Others provided air forces which reinforced the Coalition's capabilities in numerous ways. The RAF provided tactical fighter squadrons as well as helicopters, reconnaissance aircraft, tankers and transports. The Royal Canadian Air Forces (CAF) deployed air superiority and ground attack fighters available for defensive counter air missions, and support of ground forces. The French Air Force (FAF) provided tactical strike squadrons, air superiority fighters, tankers, transports, reconnaissance aircraft, maritime patrol aircraft (MPA), and helicopters. The Italian Air Force deployed attack fighters, transports, tankers, and reconnaissance aircraft, available to conduct and support air intercept and interdiction missions.

The Gulf Cooperation Council states provided logistic and operational support, as well as air superiority and ground attack fighter aircraft available to fly offensive counter air, defensive counter air, and interdiction sorties. Air forces also were available to conduct refueling, airborne command and control (C2), reconnaissance, utility, and airlift missions.

EXECUTING THE AIR CAMPAIGN

In this section of Chapter VI, the air campaign is portrayed chronologically, primarily by week, to give an historical perspective of the effort – from the first hours of Operation Desert Storm through the application of air power in the KTO during the Offensive Ground Campaign. In some instances, a particular day (D-Day, D + 1, D + 2, D + 20, and D + 38) is highlighted to show the weight of effort applied. In other cases, particular subjects, such as armored vehicle destruction or attacks on hardened aircraft shelters, have received special attention because of their significance. In the last section of this chapter, the effects of the air campaign are recounted by target set, and some operational considerations (such as air supremacy, TLAMs, and the counter-Scud effort) are addressed. But before beginning the description of air operations, a brief discussion of the techniques used during the war to evaluate the effectiveness of the air campaign is necessary to place the campaign narrative in the proper context.

Evaluating the Results of the Air Campaign

Estimates of Iraqi losses were one of a number of tools CENTCOM used to manage combat operations. CENTCOM used loss estimates, among other things, to determine when combat capabilities of Iraqi ground forces had been reduced by half (which was one of the decision criteria for beginning the Offensive Ground Campaign). A methodology for assessing battle damage therefore was developed, and adjusted as circumstances warranted.

Estimating levels of destruction inflicted on the enemy always has been difficult. This was especially true during Operation Desert Storm, with its fast-moving, high-speed air, sea, and ground campaigns, which involved massive attacks throughout the theater of operations, using a wide variety of equipment and munitions. These difficulties were compounded by the fact that some new precision weapons allowed Coalition forces to place ordnance on targets in ways that made determination of actual damage difficult, and by the fact not all platforms had sensors and equipment to record the effects of their weapons. For example, PGMs gave pilots the unique ability to target precisely and strike sections of buildings or hardened shelters, significantly complicating bomb damage assessment. BDA was, therefore, by no means a precise science. It is quite possible that assessments of Iraqi losses during the course of the war, at various times, overestimated or underestimated actual results. Thus the estimates of Iraqi losses presented in this chapter and elsewhere in the report must be read in the proper context. The loss estimates shown in this report are accurate portrayals of the information provided to decision makers at the time. They were intended at the time to represent the best estimates of Iraq's losses then available. They were used at the time by decision makers as one input into a decision making process that relied fundamentally on the exercise of professional military judgment. That, after all, is the primary purpose of

military intelligence – to assist commanders in the field in making informed judgments.

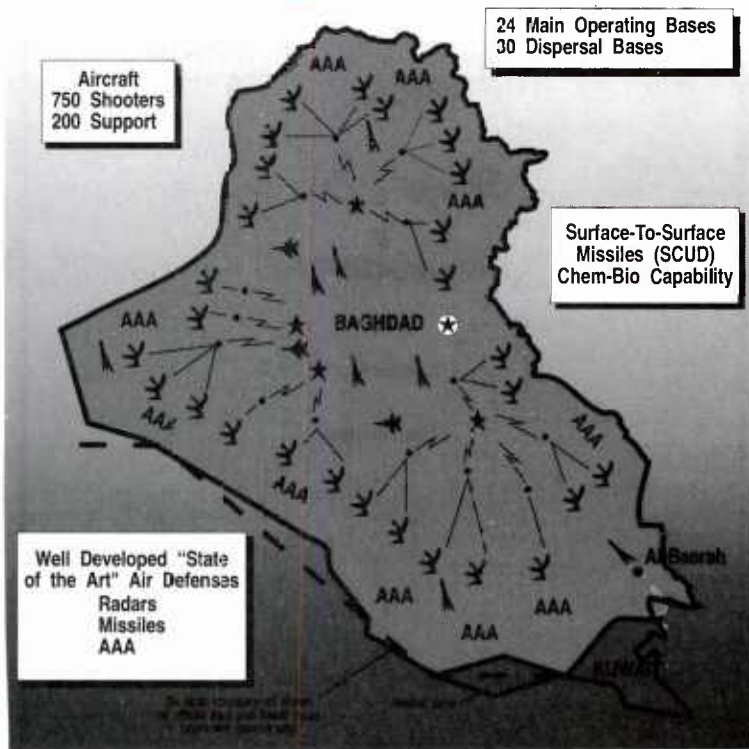
It is possible the levels of damage never will be known with precision. That said, it is important to note that, even with these limitations, probably no set of American commanders has had more information available about the battlefield and enemy forces than the commanders of Operation Desert Storm. Tactical BDA was good enough to help CINCCENT make informed decisions. In retrospect, Operation Desert Storm's success strongly suggests the decisions were sound. In the end, it was professional military judgment – assisted by BDA and other information – that chose the right time to begin the ground offensive.

Two different BDA methodologies, based on fundamentally distinct purposes and guidance were used in the two principal periods of conflict during the Persian Gulf War. Before G-Day, 24 February, BDA estimates were designed to help CINCCENT determine when Iraqi forces in the KTO had been reduced to about half of their overall combat effectiveness – the point when he would be confident in starting the ground offensive. Consequently, ARCENT attempted to track carefully the number of tanks, APC, and artillery pieces destroyed, primarily by air attack, to produce an approximate measure of Iraqi unit degradation. This was one estimate available to CINCCENT for evaluating Iraqi combat effectiveness. He and his staff also used other information such as bridge destruction, communications degradation, estimates of supplies available, troop physical condition and morale, EPW debriefings, the results of the battle of Khafji, intelligence reports and assessments, and destruction of other vehicles.

After G-Day, the emphasis shifted to ground combat. Estimates of Iraqi losses were based on reports from advancing ground units as well as reports from air units. There was a fast-paced accounting of destroyed or captured tanks, APC, and artillery pieces with little attempt to determine if the equipment was destroyed by ground, air, or sea assets, or if the equipment were in working order or in use when destroyed. (For additional discussion of BDA during the Offensive Ground Campaign, see Chapter VIII.)

In connection with this report's preparation, there were extensive searches for any information available after cessation of hostilities that would improve the wartime estimates of Iraqi equipment losses. Postwar surveys were made of selected parts of the KTO, but none covered parts of the theater large enough to permit calculation of comprehensive estimates of overall losses. Many relevant areas were in Iraq itself, and thus inaccessible after the Coalition withdrew. Many parts of Kuwait also were difficult to study because of problems such as the lack of transportation infrastructure and danger from unexploded ordnance. The two analyses based on survey data that were completed after the war cover very small, and not necessarily representative areas. In the case of one study, many of the vehicles had been abandoned without substantial damage and less than half of the tanks destroyed appeared to have been destroyed from the air. However, the sample was small and may not have been representative. Efforts to analyze the available data further are continuing.

Iraqi Air Threat



Map VI-5

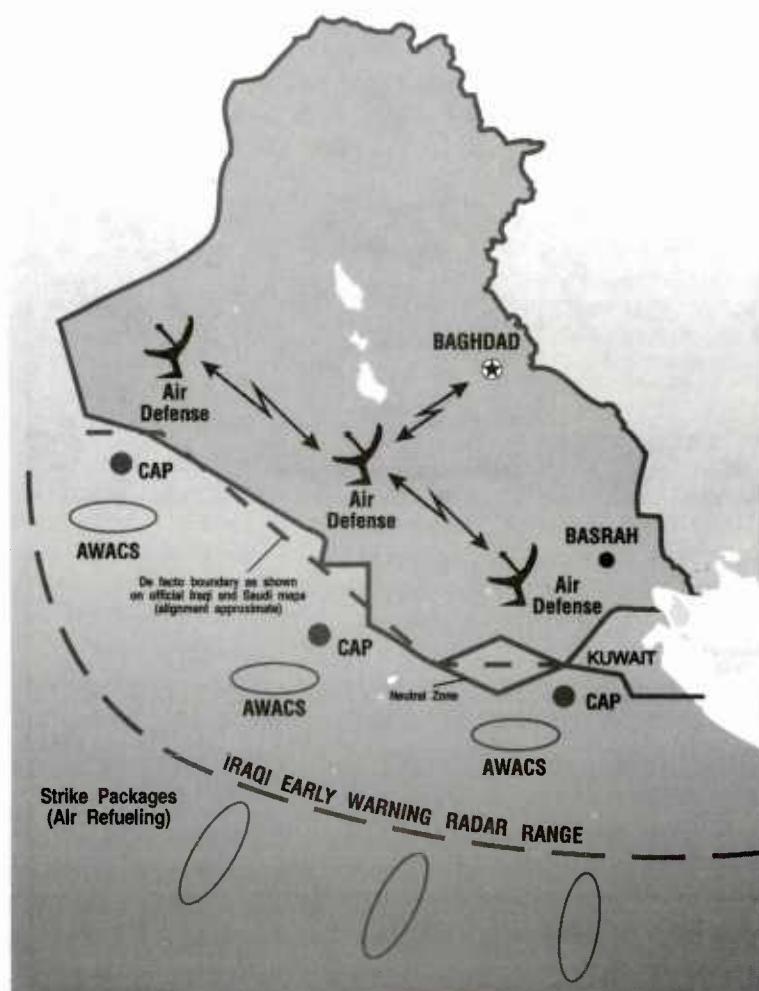
D-Day, The First Night

Early in the evening of 16 January, under the guise of routine AWACS station changes, the Coalition launched its first night crews to the standard Operation Desert Shield surveillance orbits.

At Coalition airfields and on board Coalition warships all across the Gulf region, the first hours after midnight 17 January were marked by activity with a new sense of urgency. At the air bases and on flight decks, crews prepared to launch the biggest air strike since World War II. On other warships, sailors were preparing TLAMs for their first combat launch. In cramped compartments, dozens of B-52 crew members, some of whom had left US bases hours earlier, prepared for combat. More than 160 aerial tankers orbited outside Iraqi early warning radar range and refueled hundreds of Coalition aircraft. Shifts of RC-135, U-2R, and TR-1 reconnaissance aircraft maintained normal 24-hour orbits to provide intelligence coverage of Iraq and Kuwait. E-3 AWACS and E-2Cs orbited over Saudi Arabia, powerful radars probed deep into Iraq and crews watched for Iraqi reactions. Meanwhile, the initial attack packages marshaled south of the Iraqi and Jordanian early warning and ground control intercept (GCI) coverage. As H-Hour approached, the entire attack

armada moved north, led by a fighter sweep of F-15s and F-14s. As the attack packages flew past, each AWACS moved forward to its wartime orbit. The huge air armada, comprising hundreds of aircraft from many different nations and Services, headed into the dark and threatening hostile airspace.

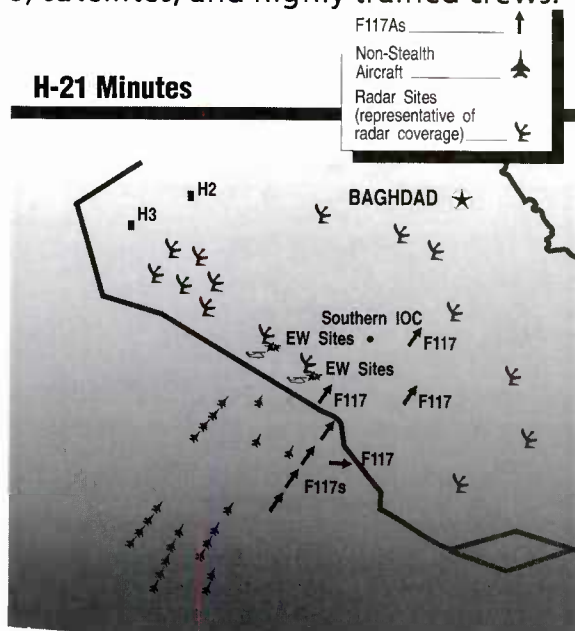
Iraqi Picture (Before H-Hour)



Map VI-6

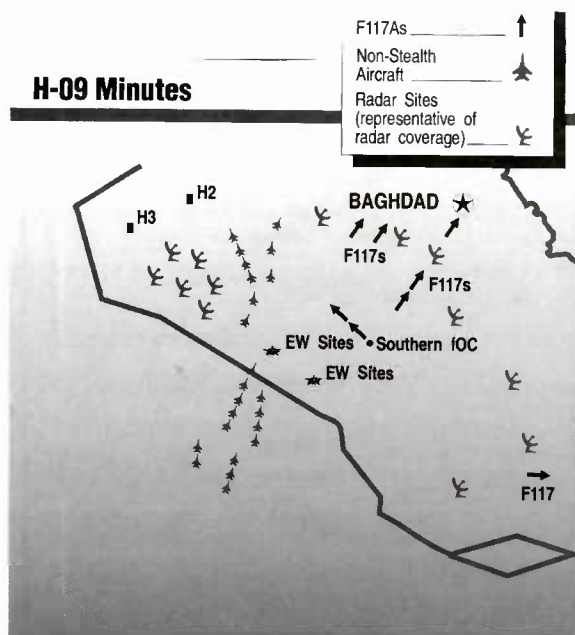
Even before the fighters struck Iraqi targets, three USAF MH-53J *Pave Low* special operations helicopters from the 1st Special Operations Wing (SOW) led nine Army AH-64 attack helicopters from the 101st Airborne Division (Air Assault) on a mission into southern Iraq. Shortly before H-Hour, the helicopters, organized as Task Force (TF) Normandy, completed the long, earth-hugging flight and sighted the

assigned targets, two early warning radar sites inside Iraq. This mission was possible because of technological advances in night- and low-light vision devices, precise navigational capability resulting from space-based systems such as the Global Positioning System (GPS) satellites, and highly trained crews.



Map VI-7
*Depiction of Helicopters,
 F-117As, and F-15Es in Relation to
 Iraqi Early Warning Radars, Intercept
 Operations Centers (IOCs), Sector
 Operations Centers (SOCs) and SAM
 sites at H-21 Minutes, 17 January*

Commitment to hostilities occurred at approximately H-90 minutes when US warships launched TLAM cruise missiles toward targets in Baghdad. At approximately H-22 minutes, the AH-64s struck the opening blow of the conflict by destroying the radar sites with Hellfire missiles. Above and in front of TF Normandy, F-117 stealth fighters from the 37th Tactical Fighter Wing (TFW) already had passed the early warning sites and were well inside Iraqi radar coverage when the attacks occurred. The timing of the helicopter attacks was determined by the projected time when Iraqi air defense radar would detect the EF-111s scheduled to support air attacks on the Baghdad area. Its job complete, TF Normandy headed for home. Nine minutes before H-Hour, an F-117A dropped the first bomb of the war, striking a hardened air defense intercept operations center (IOC) in southern Iraq, then continued on to drop a second bomb on a regional air defense sector operations center (SOC) in western Iraq. The helicopter and F-117A attacks created gaps in Iraqi radar coverage and in the C2 network for the non-stealth aircraft which followed. Meanwhile, other F-117As were about to destroy several high-priority targets.



Map VI-8



This Map of H-9 Minutes Shows Position of F-117As Well Beyond Early Warning Radar Sites and Deep into Iraq's Dense Radar Coverage. It Also Depicts Non-stealth Aircraft Passing Through Hole in Radar Coverage Created by Helicopter and F-117A Attacks on Two Early Warning Sites and an Intercept Operations Center in Southern Iraq.

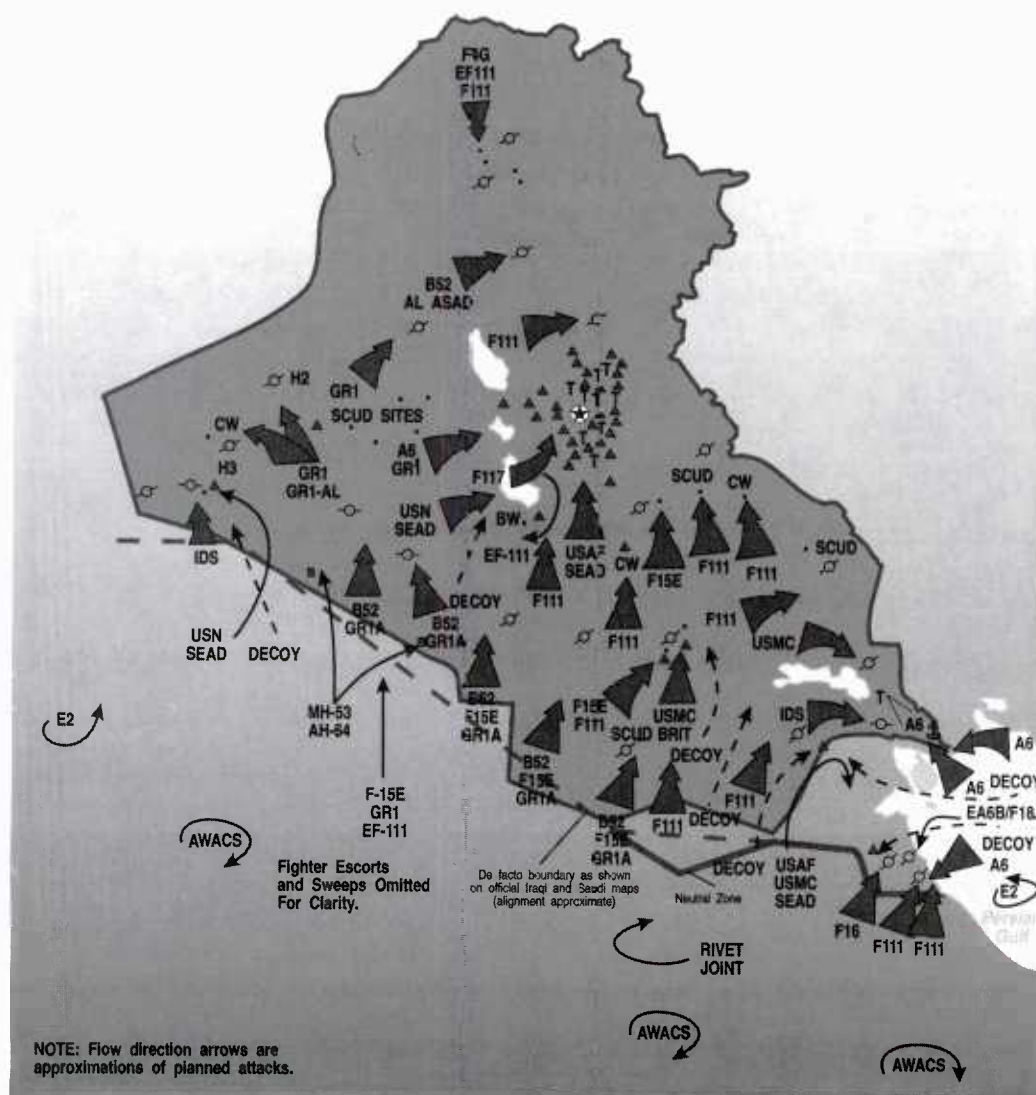
At H-Hour, 0300, two F-117As dropped the first bombs on Baghdad. Shortly thereafter, TLAMs began to strike targets in the Baghdad area. Each F-117A carried two 2,000-lb hardened, penetrating laser-guided bombs (LGBs) and, within the offensive's first minutes, bombed crucial installations in Baghdad and elsewhere. Each aircraft had an individual route through the Iraqi air defense system and a tailored target attack plan. The F-117A by virtue of its stealth characteristics allowed operations without the full range of support assets required by non-stealthy aircraft. Typically, F-117A sorties used no direct airborne support other than tankers.

An initial Coalition air task was to fragment and eventually destroy the Iraqi IADS. The initial fragmentation was accomplished by the early attacks by Apache helicopters, F-117As, cruise missiles, F-15Es, and GR-1s. Once the IADS was nullified, the enemy became increasingly vulnerable to attack and destruction from the air.

The First Wave (Planned) 0239 (L) -- 0525 (L)

[First Two Hours and Forty Six Minutes]

F-117 Target 
TLAM Target 



F-117As reached into the heart of downtown Baghdad to strike the Iraqi Air Force headquarters accurately. Ignoring flak, tracers, and SAMs, they systematically hit vital targets. One pilot high over Baghdad that night reported seeing Iraqi AAA wildly spraying fire over Baghdad, hitting the tops of buildings. AAA fire and expended SAMs probably caused some collateral damage inside the capital. Because of the density of the threat and the requirement to minimize collateral damage,



Figure VI-5

New Iraqi Air Force Headquarters, Baghdad, was a Vital Target. The F-117A was the Only Aircraft to Attack Central Baghdad Targets.

F-117As, attacking at night, were the only manned aircraft to attack central Baghdad targets. The only weapon system used for daylight attacks on central Baghdad were TLAMs, which also struck at night. F-16s, B-52s, F/A-18s, A-6s, and A-7s attacked targets in the outskirts of the city. RF-4s, TR-1s, and U-2s flew over Baghdad later in the war, when the threat was reduced.

The first wave of attackers actually encompassed three separate groups that included 30 F-117s and 54 TLAMs. Within the first five minutes, nearly 20 air defense, C3, electrical, and leadership nodes had been struck in Baghdad; within an hour, another 25 similar targets had been struck, as well as electric distribution and CW sites. By the end of the first 24 hours, nearly four dozen key targets in or near the enemy capital had been hit. These installations included more than a dozen leadership targets, a similar number of air defense and electric distribution facilities, 10 C3 nodes, and installations in several other target sets. This was not a gradual rolling back of the Iraqi air defense system. The nearly simultaneous suppression of so many vital centers helped cripple Iraq's air defense system, and began seriously to disrupt the LOCs between Saddam Hussein and his forces in the KTO and southeastern Iraq. Nonetheless, the Iraqis always retained some ability to recover at

least partially, given enough time and resources. Consequently, target categories required constant monitoring to measure residual capability and recovery attempts. Restrikes and attacks on new targets were used to maintain the pressure. As a result, according to DIA and CENTCOM intelligence reports, it became increasingly difficult for the Iraqi political and military leadership to organize coherent, timely, and integrated responses to Coalition actions. In part, this was due to physical destruction of hardware and systems, such as C3 links or CPs. It also was due to the psychological impact of the Coalition attacks. Leaders could not gather timely information on what was happening. When they did get information, they learned specific parts of the Iraqi government and military leadership had been destroyed, sometimes to the extent that individual offices had been bombed and eliminated.

First-day TLAM attacks, launched from cruisers, destroyers, and battleships in the Persian Gulf and the Red Sea, were coordinated with F-117A and other manned aircraft during the initial attacks as part of the carefully crafted Strategic Air Campaign. The Aegis cruiser *USS San Jacinto* (CG 56) fired the first TLAM from the Red Sea. *USS Bunker Hill* (CG 52) followed moments later from the Persian Gulf. In the first 24 hours, 116 TLAMs from seven warships hit 16 heavily defended targets in Baghdad and its vicinity, damaging electrical power facilities and C2 capabilities.

Conventional ALCMs also were used in the opening hours of the air campaign. B-52s that had taken from Barksdale AFB, LA, more than 11 hours before H-Hour launched 35 ALCMs to attack military communications sites and power generation and transmission facilities.

Nearly 700 combat aircraft, including fighters, bombers, and EW aircraft (jammers and high-speed antiradiation missile (HARM) shooters) entered Iraqi airspace that night. As they began their attacks, they benefited from encountering a foe who already was reeling and partly blinded from the opening strikes.

Strike packages were as small as a single F-117A or could contain more than 50 aircraft. The strike package against the Ahmad Al-Jabir Airfield complex, for example, consisted of 16 Low-Altitude Navigation Targeting Infrared for Night (LANTIRN)-equipped F-16s with MK-84 bombs, escorted by four F-4Gs configured with HARMs for SEAD, an EA-6B EW jammer, and four F/A-18s configured for the strike-fighter dual role. Supporting these strike packages were many tanker aircraft, including KC-135s, KC-10s, KA-6s, and KC-130s, which were airborne and waiting outside Iraqi airspace.

From the Red Sea and the Persian Gulf, and from bases along the Persian Gulf, Navy and Marine aircraft headed towards their targets near Baghdad and in southwestern and southeastern Iraq. Nineteen USAF F-15Es headed for Scud missile sites in western Iraq, passing through the gap the helicopters and F-117s had blown in the Iraqi defenses. From bases across Saudi Arabia and the Gulf states, other aircraft prepared to strike strategic centers of gravity throughout Iraq.

An overall depiction of the Coalition air armada at H-Hour would show a multipronged effort. Navy aircraft from the Red Sea carriers *USS John F. Kennedy*

and *USS Saratoga*, together with USAF and RAF aircraft, were preparing to strike targets near Baghdad and at heavily defended airfields in western Iraq. Their targets included Scud missile sites, airfields, and air defenses. Navy aircraft also flew many SEAD and EW missions. In southeastern Iraq, between Baghdad and Kuwait, targets such as airfields, port facilities, and air defenses were attacked by Navy aircraft and other Coalition forces, including RAF, RSAF, and Kuwaiti Air Force aircraft, based in eastern Saudi Arabia. Coming up the middle were Coalition air forces striking fixed targets in southern and central Iraq.

Each of the pilots of four F-15Cs from the 58th Tactical Fighter Squadron was flying his first combat mission on 17 January, sweeping for Iraqi fighters. Around Baghdad, "The whole ground was red with Triple-A fire as far as you could see," recalled one pilot. The four F-15s were inbound toward Mudaysis airfield when two Iraqi Mirage F-1 fighters took off and headed for them at low level. Using the look down, shoot down radar capability, one F-15 fired an AIM-7 radar-guided missile and saw the F-1 explode. The Iraqi wingman, evidently startled by this disaster, created an even greater one for himself when he turned right and dove straight into the desert floor.

58th TFS Unit History

Simultaneously, scores of USAF, Navy, USMC, Army, and other Coalition attack and support aircraft closed on strategic targets throughout Iraq and Kuwait, focusing on the IADS and Iraq's C2 infrastructure, including communications and the electrical power distribution system, which supported Iraqi military operations. The Iraqi air defense system was overwhelmed by the number of attacking aircraft. Nothing approaching the depth, breadth, magnitude, and simultaneity of this coordinated air attack ever had been achieved previously.

The first missions conducted to suppress enemy air defenses were difficult yet vital. At one time during that first hour, the lead F-4G flight countered more than 15 radar sites and several different type SAMs. More than 200 HARMs were fired against Iraqi radars, 100 by USMC F/A-18s alone. USAF EF-111s and F-4Gs, Navy and USMC EA-6Bs, A-6s, A-7s, and F/A-18s, determined threat locations then jammed enemy radar installations or attacked them with HARMs, while EC-130 *Compass Call* aircraft jammed enemy communications. These SEAD efforts helped keep Coalition losses low; in fact, most missions were possible only because of the SEAD aircraft.

One effective tactic to fool enemy air defenses involved Navy and Marine Corps (USMC) tactical air launched decoys (TALDs). The decoys caused Iraqi defenders to turn on their radars, revealing their locations and making them vulnerable to Coalition SEAD aircraft. The tactic confused the Iraqis and helped divert their defensive effort.

On the morning of 17 January, an EA-6B from Marine Tactical Electronic Warfare Squadron Two provided electronic warfare support for Marine, Navy, and Royal Air Force strike packages attacking strategic targets at the Al-'Amarah and Az-Zubayr command and control sites, as well as the Az-Zubayr railroad yards and the Al-Basrah bridges across the Tigris River. These targets were heavily defended by interlocking belts of surface-to-air missiles (SAM) and antiaircraft artillery (AAA). Iraqi fighters also were a potential threat. This was a dangerous mission – among the first daylight strikes of the war. Long before they approached the targets, the EA-6B crew started to work. The first enemy radar that came up was quickly jammed. Shortly after, however, additional radars were noted searching for the strike groups. Jamming of Iraqi long range early warning radars allowed the strikers to approach undetected. However, Iraqi ground control intercept radars as well as target tracking radars simultaneously began probing the Coalition strike package. The EA-6B crew quickly introduced intense electronic jamming into all modes of the Iraqi air defense system, which prevented the vectoring of enemy fighters. They also forced SAM and AAA systems into autonomous operation, uncoordinated by the command and control system which greatly reduced their ability to locate and track Coalition aircraft. To accomplish this, the EA-6B crew did not attempt evasive action but placed themselves into a predictable, wings-level orbit which highlighted their position amidst the beaconing and jamming strobes of the enemy radars. The severe degradation to radio transmissions caused by jamming interference limited the EA-6Bs ability to receive threat calls, making them vulnerable to enemy aircraft. Nonetheless, the crew remained on station, enabling all Coalition aircraft to strike the targets, accomplish the missions, and return home without loss or damage.

3rd Marine Aircraft Wing Award Citation

The joint SEAD effort also used 10 long-range Army tactical missile system (ATACMS) missiles to attack an Iraqi air defense site with good success. Overall, Coalition SEAD was highly successful and instrumental in limiting aircraft losses.

First Night Reactions

As these initial strikes took place, the pilots and ground crews back at base or aboard ship could only wait. No one knew how many losses the Coalition would suffer. Even more concerned were the commanders who sent the crews into combat. The commander of the F-111F wing at At-Taif airbase, for example, said, "losses were predicted to be at least 10 percent. I was figuring on ours being higher than that, because of the targets we had. I was personally convinced we were going to lose some airplanes that first night." No matter what the final cost, everyone

anticipated the heaviest losses would be during the first attacks, when the defenses were strongest and the air campaign had not had time to win air superiority.

Fortunately, all but one plane (an F/A-18 from the *USS Saratoga*) returned safely. But no one had any illusions that this would be quick or easy, that victory would be achieved without hard fighting and losses. Indeed, even as the air campaign's first wave of aircraft headed for home, the second wave was preparing to strike its targets.

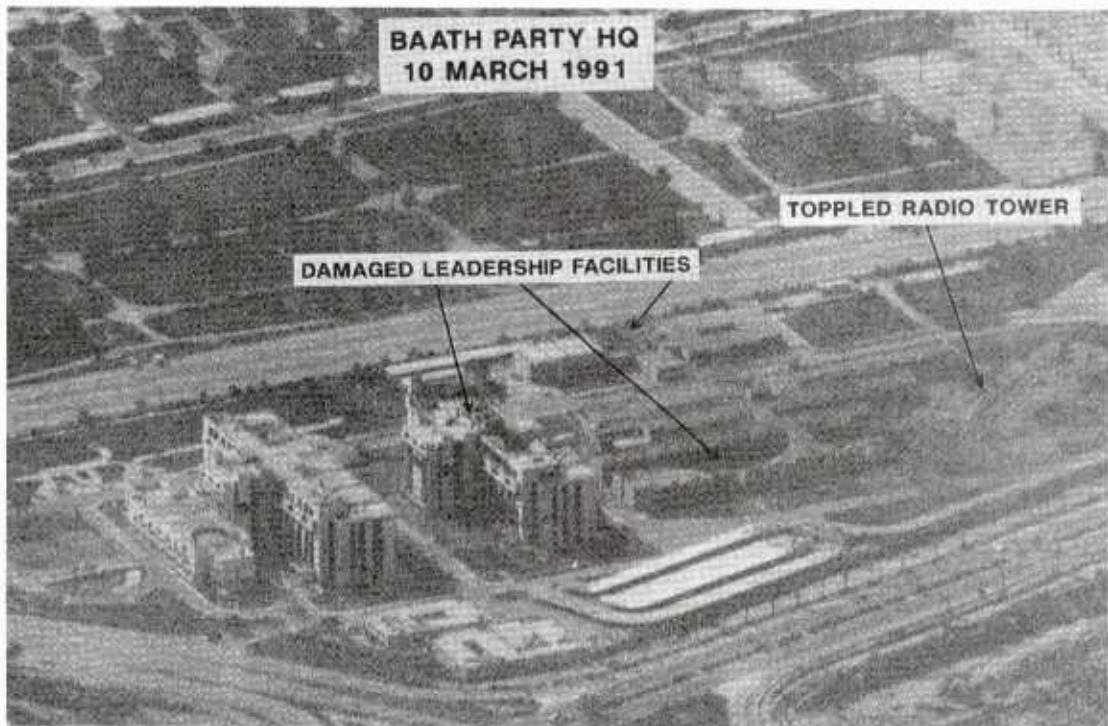


Figure VI- 6
Coalition Air Strikes also Were Directed Against Iraqi Leadership Capabilities.

D-Day, Daytime Attacks

The start of the second wave attacks roughly coincided with sunrise. This made available even more aircraft, as those best suited for daylight operations began flying missions. Throughout the day, USAF A-10s conducted more than 150 sorties against Iraqi ground forces in the KTO and radar sites in Iraq, while F-16s struck targets in the KTO, including airfields and many SAM sites. The initial USMC strikes during the dawn hours of the first day included attacks on enemy aircraft on runways or in revetments at the heavily defended Iraqi air bases of Tallil, Sh'aybah,

Al-Qurnah, and Ar-Rumaylah. Thirty-one aircraft were assigned to hit Tallil Airfield alone. Thirty-six aircraft were tasked to strike other targets in and around Al-Basrah, and more than a dozen aircraft struck the heavily defended airfield at Sh'aybah. Other attacks hit the airfield, bridges, and railroad yards at Al-'Amarah on the outskirts of Al-Basrah. AV-8Bs attacked armor and artillery targets in southern Kuwait.

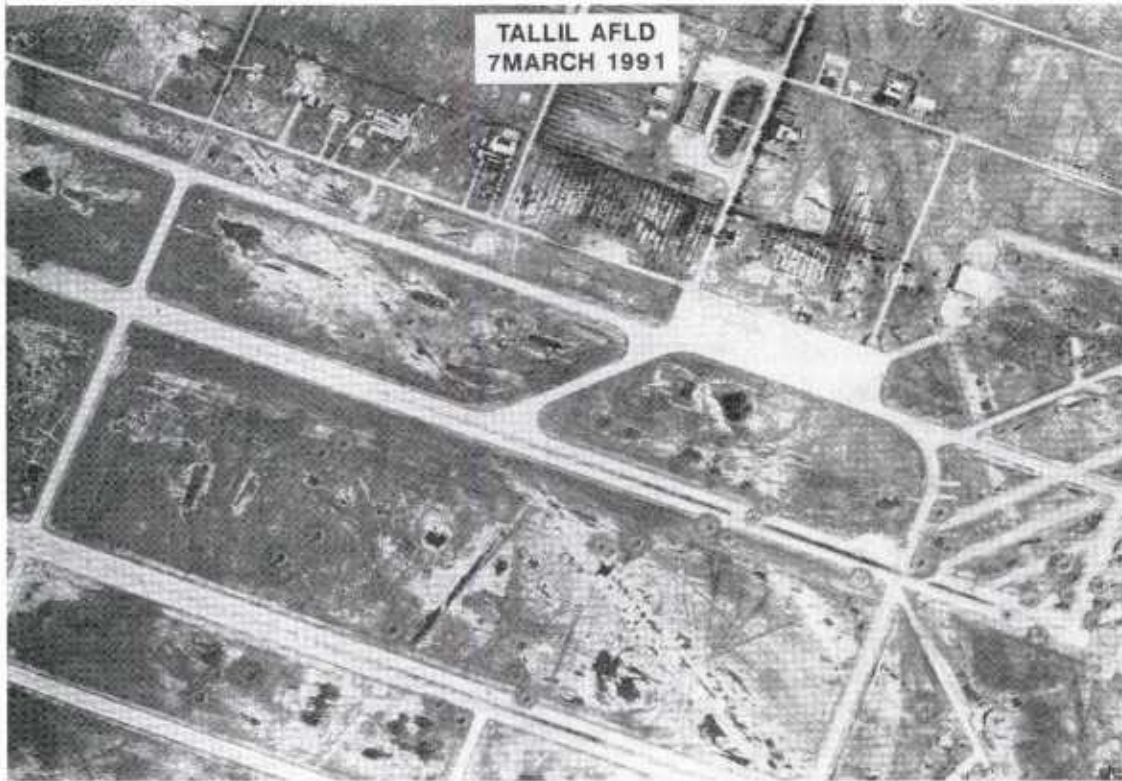


Figure VI-7

Aerial Attacks Against Iraqi Airfields Such As Tallil Airfield Further Denied the Iraqi Air Force Use of the Sky.

Planners were unable to determine if F-15E strikes against fixed Scud launch sites had been successful. The Coalition did not know how many mobile Scud launchers Iraq had – in retrospect, some early estimates of the number were too low. A basic planning assumption always had been that Iraq would use its Scuds to attack Israel, intending to draw it into the war and fragment the Coalition. Scuds also would be targeted against Saudi Arabia and other regional states. This assumption proved correct, but the amount of effort and the length of time required to deal with the Scud threat was underestimated.

By nightfall on the first day of Operation Desert Storm, the Iraqis had suffered serious damage to the strategic C3 network, the formerly robust strategic air defense system, and key leadership facilities. Part of the known NBC long-term threat already had been degraded, and Coalition air forces had defeated Iraqi Air Force attempts to offer a coordinated resistance.

D-Day, Second Night

The Coalition's ability to fight at night made it difficult for the Iraqis to use the cover of darkness to maintain and repair equipment, and replenish supplies. This was a key advantage helping to keep pressure on the Iraqis 24 hours a day. As night fell, a third wave of Coalition aircraft continued the attacks on key Iraqi strategic targets with emphasis on air defenses. The Iraqi Air Force coordination of defensive operations had been defeated up to this point; indeed they flew only about 50 air patrols during the first day. Shortly after nightfall on the second night of Operation Desert Storm, F-111Fs and A-6Es attacked Iraqi airfields. These aircraft made major contributions because their laser-designator systems let them identify and strike targets day or night without the need for a separate designator airplane. In addition, the F-111s' heavy bombload and relatively long range let them concentrate many precision bombs on target in a short period of time, deep in enemy territory, while exposing a limited number of aircraft to the threat. B-52s struck key Republican Guard elements, with several sorties targeted against the Tawakalna Mechanized Infantry Division.

On D-Day, JTF Proven Force concentrated on targets in northern Iraq in the Mosul, Kirkuk, Tikrit, Quayyarah, and Erbil areas. The EC-130, KC-135, and EF-111A aircraft, along with their F-15 protection, established orbits north of the border. The F-111Es turned south and arrived over their targets at 0410 on 18 January.

D-Day, Controlling Operations

Unity of effort in coordinating and tasking Coalition air power was crucial to ensuring that all Coalition aircraft operated in support of stated goals. The following air-to-air engagement was successful, in part, because airborne warning and control aircraft were part of a unified effort.

A strike package hit the oil facility at Habbaniyah and the airfield at At-Taqaddum with 32 F-16s; 16 F-15s provided air cover, while four EF-111s and eight F-4Gs provided jamming and SEAD support. Over Saudi Arabia and the Red Sea and Persian Gulf, the AWACS and E-2C surveillance planes watched the missions and identified who was friendly. During this particular F-16 mission, the AWACS

A MiG shootdown recounted by an F/A-18 pilot, VFA-81, from USS Saratoga: "We crossed the Iraqi border in an offset battle box formation to maintain the best lookout possible. As the strike developed, the volume and intensity of communications over the strike frequency increased. Bandit [enemy aircraft] calls from the E-2 to our other strike group crowded into my mind as I plotted where those bandits should be relative to our position. A call from the E-2 clearly intended for the Hornet strikers finally registered: 'Bandits on your nose, 15 miles!' I immediately selected Sidewinder [air-to-air missile] and obtained a radar lock on a head-on, supersonic Iraqi MiG-21. I fired a Sidewinder and lost sight of it while concentrating on watching the MiG. Thinking the Sidewinder wasn't tracking, I selected Sparrow and fired. A few seconds after the Sparrow left the rail, the Sidewinder impacted the MiG-21 with a bright flash and puff of black smoke. Trailing flame, the MiG was hit seconds later by the Sparrow and began a pronounced deceleration and descent. As the flaming MiG passed below me, I rocked up on my left wing to watch him go by. Another F/A-18 pilot killed the MiG's wingman with a Sparrow shot only seconds after my missiles impacted the lead MiG After the hectic activity associated with bagging a MiG while entering a high threat target area, the dive bombing run on our primary target was effortless. Visible below me were numerous muzzle flashes, dust and smoke from gun emplacements, a light carpet of AAA bursts and several corkscrew streaks of handheld SAMs being fired. I glanced back at the target just in time to see my four 2,000 pound bombs explode on the hangar. Our division quickly reformed off target without incident and beat a hasty retreat south of the border. Our relief in having successfully completed the strike without loss to ourselves was overwhelming."

Unit Mission Report

controllers were able to alert the covering F-15s that two Iraqi MiG-29s were in the area and, in the ensuing action, the F-15s shot them both down. One victory went to a USMC exchange officer flying with the USAF's 58th Tactical Fighter Squadron.

D-Day, Summary

One key immediate objective was to seize air superiority so the full weight of Coalition air power could be brought to bear. The Iraqi Air Force's disorganized response was a positive and heartening sign that air superiority operations were succeeding. Air superiority was clearly important to the rest of Operation Desert Storm. Although the Iraqis would retain the ability throughout the war to react piecemeal to some Coalition strike packages, they would lose the ability to

coordinate defensive actions, and each defensive sector would become increasingly isolated from the overall system.

Air superiority, or the dominance of a group of aircraft in a given time and space without prohibitive interference by the opposing force, was effectively gained in the first hours of the war. Coalition aircraft demonstrated they could control airspace of their choosing – the Iraqi Air Force could not coordinate an effective defense. Air supremacy (the degree of air superiority wherein the enemy is incapable of effective interference) would be announced on 27 January.

D + 1 (18 January)

Day two operations continued the campaign against key strategic and tactical targets. Nuclear targets were again struck, as they were on D-Day. Between 0400 and 0530, the Coalition attacked air defense, BW and CW facilities, leadership targets, and airfields using more than 80 Coalition night-attack aircraft, including F-117s, F-15Es, F-111s, A-6s, and RAF and Italian Air Force GR-1s. Shortly after sunrise, F-16s and F/A-18s attacked Iraqi army units, including three Republican Guard division elements. Nearly 100 F-16 sorties struck the Tawakalna Division. Approximately 150 A-10 sorties were scheduled against Iraqi forces near, and west of the tri-border area, where the ground campaign's flanking maneuver would pass through weeks later. F/A-18s and A-6s, supported by EA-6Bs, attacked Tallil Airfield. Large groups of USMC aircraft flew against the Republican Guard's Al-Madinah Division, just west of Al-Basrah. EA-6Bs provided composite active and passive electronic support for air strikes in and around Basrah.

JTF Proven Force aircrews flew their first combat missions shortly after midnight 18 January, when F-111Es raced into Iraq at low level to destroy four EW radar sites in northern Iraq and open an electronic gate. The sky was overcast at 3,000 feet with visibility at three miles with fog. Despite the poor weather, the F-111E crews found the targets and delivered their ordnance, encountering little Iraqi resistance. These, and subsequent missions forced Iraqi commanders to contend with attacks from all directions and to respond to a second air front as well as a potential second ground front. This pressured Iraq from the north, surrounded and forced them to retain forces in the northern region.

Early in Operation Desert Storm planning, CINCENT had identified the RGFC as a key target; Phase III attacks on the RGFC and frontline armored forces in Kuwait began the first day. The RGFC began to feel real pressure starting the next day, when Coalition aircraft struck three divisions, the Tawakalna Mechanized Infantry Division, and the Hammurabi and Al-Madinah armored divisions, repeatedly throughout that day and the next.

During these two days, the three divisions were targeted for strikes by 214 F-16s, 36 F/A-18s, eight F-15Es, and 31 B-52s. Not included in these totals are missions

ATO PLANNED ATTACK SORTIES AGAINST THE RGFC

	<u>D + 1</u>	<u>D + 2</u>
TAWAKALNA	90 F-16s, 8 F/A-18s, 3 B-52s	36 F-16s, 3 B-52s
HAMMURABI	16 F/A-18s, 3 B-52s	42 F-16s, 6 F/A-18s, 8 F-15Es, 12 B-52s
AL-MADINAH	24 F-16s, 3 B-52s	2 F-16s, 6 F/A-18s 7 B-52s

not targeted directly against these divisions but which nonetheless affected their combat capability, such as air strikes against communications nodes outside the KTO.

The Navy attacked Iraqi naval installations near Umm Qasr, hit hangars and parking ramp areas at Sh'aybah and Ahmad Al-Jabir airfields during the late morning, and struck 17 oil, electric, and leadership targets with TLAMs.

D + 1, Night

Darkness on D + 1 did not mean the Iraqis would gain any respite. Coalition forward looking infrared (FLIR)- and radar-equipped aircraft attacked bridges behind the Republican Guards, to cut them off from their supply bases. Seven B-52 sorties took off from bases in the CONUS and bombed RGFC divisional elements in the KTO. An hour before midnight, a dozen F-117s bombed key C3, leadership, and strategic air defense installations, including the ministries of Defense, Information, and Internal Security in downtown Baghdad.

By the end of the second day, Navy warships had fired 216 TLAMs, 64 percent of those fired during Operation Desert Storm, in support of the air campaign, while continuing to engage surface combatants, antiship missile bases and to track and destroy floating mines in the Persian Gulf. On 17 and 18 January, the Persian Gulf battle force flew more than half of its initial strikes against Iraqi naval facilities, coastal defense sites, and fortified oil platforms Iraq used in surveillance and small boat operations. Specific targets included the port facility, naval base, and Styx missile storage facility at Umm Qasr; the coastal defense sites at Al-Faw, Mina 'Abd Allah, Al-Qaruh Island and Umm Al-Maradim; the Mina Al-Bakr oil terminal and platform; and the Khawr Al-'Amayah oil platform. Naval aircraft flying from the Red Sea and Persian Gulf battle groups completed 1,100 sorties in support of the air campaign. USMC attack aircraft began shaping the battlefield during the first two days. F/A-18s, A-6s, and AV-8Bs attacked and destroyed armored vehicles, tanks, artillery, and Free Rocket Over Ground batteries throughout southern and central

Kuwait. USMC F/A-18 and EA-6B aircraft struck Tallil airfield and bombed the Republican Guard's Al-Madinah Division as well as a Republican Guard armored battalion. AV-8Bs nearly tripled their sorties from the first day, flying 55 missions against Iraqi front-line artillery battalions on the eastern side of Kuwait.

RAF GR-1s continued attacking Iraqi airfields, while A-6s attacked electricity-related and C3 targets in the Al-Basrah, Az-Zubayr, and Al-Hadithah area. B-52s again bombed Republican Guard formations and began striking industrial targets, with eight sorties targeted against Iraqi oil installations in isolated areas where there was little probability of collateral damage. Finally, at 0300, the dividing line between D + 1 and D + 2, 10 F-117 sorties struck 17 C3, air defense, and leadership targets around Baghdad and At-Taji.

D-Day through D + 6: Summary of Week One (17-23 January)

At the end of Operation Desert Storm's first week, substantial results had been accomplished against several target categories, according to CENTCOM and intelligence reports. Many important targets had been destroyed by the first two days' operations, affecting several key Iraqi capabilities. The Coalition enjoyed air superiority, primarily because the Iraqi Air Force was not vigorously contesting the air campaign; still, the Iraqi Air Force remained a potential threat. Iraq's strategic air defenses and C3 network had been fragmented, partly as a result of damage to the Iraqi national electric power grid. Iraq's known nuclear and BW programs, as well as its stocks of deployable CW were under daily attack. National political and military leadership was becoming increasingly cut off and isolated from preferred, secure means to direct operations. Iraqi ground and naval forces in the KTO were attacked from the beginning, to eliminate their ability to conduct substantial offensive operations and reduce their ability to oppose later military operations.

In combination with the naval embargo, the Strategic Air Campaign's early effect on Iraqi war support infrastructure was substantial. Iraq's internal fuels refining and production capability was shut down, limiting its ability to produce fuel for its tanks, planes, and war-supporting infrastructure and resulting in government-imposed rationing of pre-attack inventory. Saddam Hussein's internal telecommunications capability was so badly damaged that, while he could broadcast televised propaganda to the world by portable satellite uplinks, he was limited in the use of telecommunications to influence the Iraqi populace.

During the first week, aircraft attacked Iraqi facilities throughout Iraq and Kuwait. USAF F-117As, F-16s, B-52s, A-10s, and F-4Gs, Navy and USMC A-6Es and F/A-18s, USMC AV-8Bs, and Navy A-7s attacked air defense radars, communications nodes, and military headquarters. During the first 24 hours alone, for example, 3rd MAF flew four major strategic strike packages. Another three waves hit such targets as the bridges in Al-Basrah and the RGFC Al-Madinah Division on days two and three. Aircraft such as RAF and RSAF GR-1 fighter-bombers attacked Iraqi

airfields to destroy aircraft and bomb support facilities, and to suppress air defenses. USAF F-15s, Navy F-14s, and Navy and USMC F/A-18s provided CAP and sweeps for attack packages and played an important role in establishing air supremacy quickly. USAF A-10s performed Scud-hunter and antitank missions.

The Iraqi Air Force had lost 39 aircraft, 14 of them in air-to-air combat. The Coalition's technology provided the ability to detect and destroy enemy fighters from beyond visual range. Coalition aircraft losses had been remarkably light, due in large measure to the successful initial attacks that quickly seized the initiative. Eleven US aircraft had been lost in combat, while other Coalition forces had lost six, most notably four RAF GR-1 Tornados lost on low-level airfield attack missions. With the possible exception of one F/A-18 loss still under investigation, all Coalition losses were inflicted by ground-based air defenses (antiaircraft fire or SAMs).

On 19 January, as more than 70 F-16s, along with F-15 escorts and EF-111 and F-4G support, headed toward Baghdad, the weather steadily worsened. Just after the package broke out of the weather north of the Iraqi border, antiaircraft artillery (AAA) fire disrupted the formation. About a fourth of the pilots could not find the rest of the formation and had to return home. The first group to strike were the F-16s from the 388th Tactical Fighter Wing, which hit the nuclear research facility near Baghdad. Unfortunately for the following F-16s, the Suppression of Enemy Air Defense package of F-4Gs had fired all its high-speed antiradiation missiles and left the area, as did the covering F-15s. That left the F-16s from the 614th Tactical Fighter Squadron with no air cover and no electronic support assets. The F-16s immediately came under heavy surface-to-air missile and AAA fire — two were shot down.

401 Tactical Fighter Wing Report

Perhaps the most significant tactical issue to arise in planning the air campaign concerned Coalition aircraft flying above the AAA and hand-held SAMs threat. Despite the strong peacetime emphasis on training for low-level delivery tactics, which exploit terrain to reduce aircraft detectability to radar and hence vulnerability to SAMs and to increase weapon delivery accuracy under the weather, the density of the Iraqi AAA and the dangers posed by unaimed barrage fire to low-flying aircraft drove some aircraft to higher altitude delivery tactics. After the initial attacks on Iraqi air defense nodes succeeded in largely neutralizing the SAMs able to engage at medium and high altitudes, a virtual sanctuary existed for Coalition aircraft above 10,000 feet, allowing medium-altitude delivery tactics.

Two factors slowed progress of the air campaign in its first week: bad weather and a greater-than-expected effort against Scuds. A weather front stalled over Iraq on the third day of the conflict, and disrupted operations for the next three days. Many sorties were canceled; others were diverted to different and sometimes

less important targets; some missions were less effective even when they got to their assigned targets, or flew into greater danger.

Because the effort to suppress Scud attacks proved more difficult than originally anticipated, greater emphasis against Iraqi Scuds began on the third day; this effort also took sorties away from other planned targets. Although the Army's Patriot air defense missile system experienced operational success against Scuds, the Coalition still faced an urgent requirement to prevent launches, and the Iraqi ability to hide before and after launch proved considerable.

D + 10 (27 January – CINCCENT Declares Air Supremacy)

The air superiority gained in the first days of Operation Desert Storm, and the air supremacy declared on D + 10, against some of the more heavily defended airspace in the history of warfare, granted Coalition aircraft a safety and freedom that permitted operations at high and medium altitudes over Iraq with virtual impunity. Air attacks continued on strategic targets in Iraq and to cut off and destroy the combat effectiveness of the Iraqi army in the KTO. For example, in Iraq, Coalition air forces continued to target Scud production and storage facilities, airfield facilities at H-2, Tallil, and Shaykhah Mazhar as well as the air defense headquarters, the Ministry of Industry and Military Industrialization and several secret police and intelligence headquarters buildings in Baghdad. In the KTO air forces targeted the Ar-Rumaylah ammunition storage area, the Al-Basrah radio relay and TV transmission facility, divisional logistics sites, and directed hundreds of sorties against Iraqi army artillery, armor, and support units.

The Iraqi Air Force was expected to react to Coalition attacks. However, Coalition fighter pilots were confident they would prevail. Although the Coalition had air superiority at the end of D-Day, commanders wanted to guarantee the Iraqi Air Force would stay out of the fight; they wanted no surprises.

When Iraqi aircraft challenged the Coalition and suffered high losses, Iraq tried to shelter its aircraft. Iraqi doctrine envisioned keeping the Iraqi Air Force as a kind of strategic reserve, a role it had fulfilled during the war with Iran. Saddam Hussein thought his Air Force would be safe inside the extensive Iraqi aircraft shelter system.

For the first week of the war the Iraqi Air Force averaged only about 30 fighter sorties a day; it did not lose many airplanes that week because it did not fly much. Coalition planners considered the Iraqis might suddenly launch an aerial offensive, a last-gasp expenditure of the air force in an effort to engage Israel, attack Dhahran or Riyadh, cause significant Coalition ground casualties (perhaps through a CW attack), or strike a Fleet element in hopes of severely damaging a carrier. Any of these possibilities was highly undesirable in its own right, but, in addition, might galvanize western public opinion against the war, or split the



Figure VI-8

Saddam Hussein Tried to Protect His Air Force in Hardened Aircraft Shelters. Penetrating Bombs Denied This Sanctuary.

Coalition. To preclude this possibility, the Coalition began attacking the hardened aircraft shelters.

This was a difficult task. The Iraqis had 594 shelters, some of which were believed to be hardened in a manner similar to missile silos, able to withstand the effects and blast over-pressures that would accompany nearby air-burst detonation of tactical nuclear weapons. Although Iraqi airfields had been attacked since the first hours of the war, the early emphasis was on denying the use of the runways, not on destroying the shelters (except those suspected of hiding Scud missiles). On 23 January, however, the JFACC changed the tactic and started attacking directly the aircraft hidden in shelters, using 2,000-lb case-hardened penetrating LGBs. F-117As attacked Balad and other airfields. F-111s and RAF Tornados and Buccaneers attacked the shelters from medium-altitudes, which gave the crews a better, longer look at their targets than low-altitude attacks. Other Coalition aircraft provided SEAD support and fighter cover.

The impact was dramatic. Post-strike target photos revealed the progressive destruction of the Iraqi Air Force. Each F-111 carried up to four bombs. In one attack, 20 F-111s made two passes each on an airfield, delivering PGMs directly on

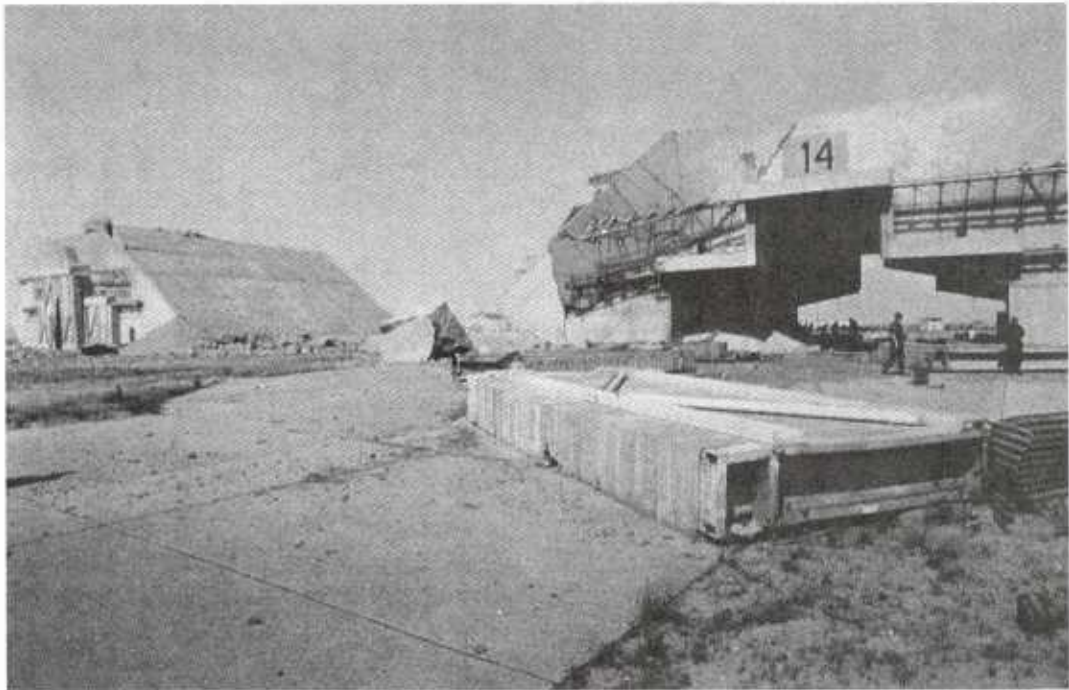


Figure VI-9

The Power of the Weapons Used Against Airfield Shelters is Shown. Concrete and Steel Blast Doors Weighing as Much as 60 Tons Sometimes Were Hurlled up to 250 Feet Across the Tarmac.

command bunkers and aircraft shelters, within seven minutes. This equates to a weapon impact about every five seconds. Most of these case hardened bombs penetrated many feet of reinforced concrete and detonated inside the shelters, causing catastrophic explosions that destroyed the shelters and their contents from the inside out. Concrete and steel blast doors weighing as much as 60 tons were hurled up to 250 feet. In some cases, the bombs penetrated the roof and the floor of the shelter before detonation, crushing aircraft between the floor and ceiling.

Although the Iraqis had flown a few aircraft to Iran before Operation Desert Storm, most had been cargo or transport aircraft. On 26 January, however, the Iraqis suddenly began a mass exodus of their more capable combat aircraft to Iran. During the next three days, CENTCOM estimated nearly 80 combat aircraft fled across the border.

The Coalition responded by establishing barrier air patrols between Baghdad and the Iranian border with F-15s, and later with F-14s, which resulted in several MiG-23s being shot down. No Iraqi aircraft entered Iranian airspace for several days. However, when the patrols were reduced, the Iraqis resumed the flights. Between 6

and 10 February, more than 40 aircraft fled to Iran, where aircraft and pilots were interned by the Iranian government. The Coalition then increased the patrols and prevented most aircraft from leaving Iraq.

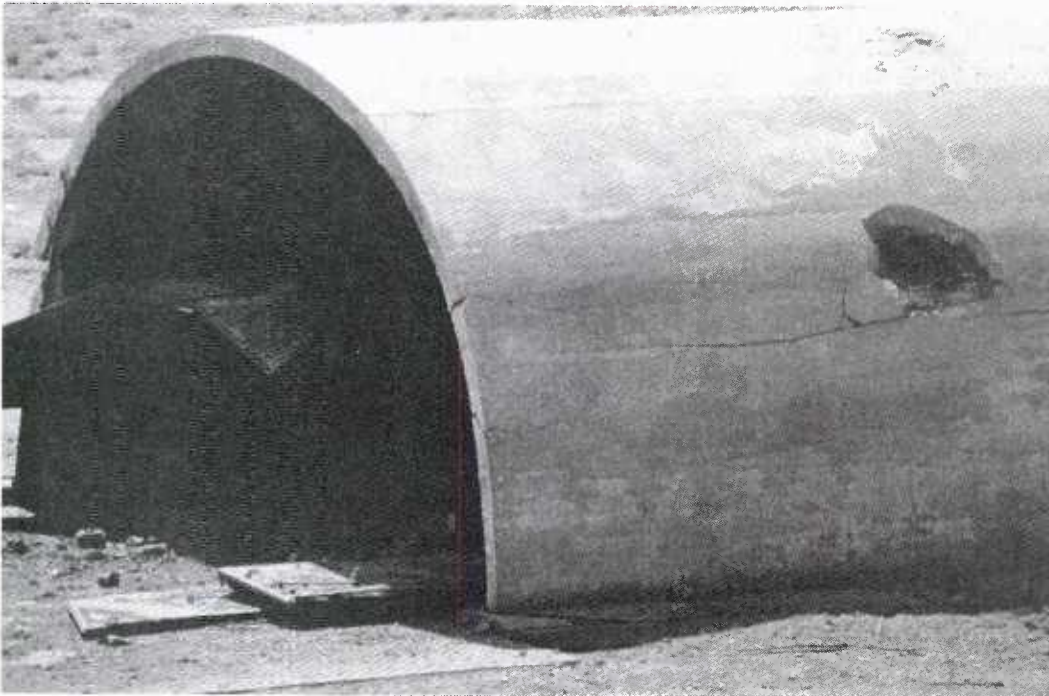
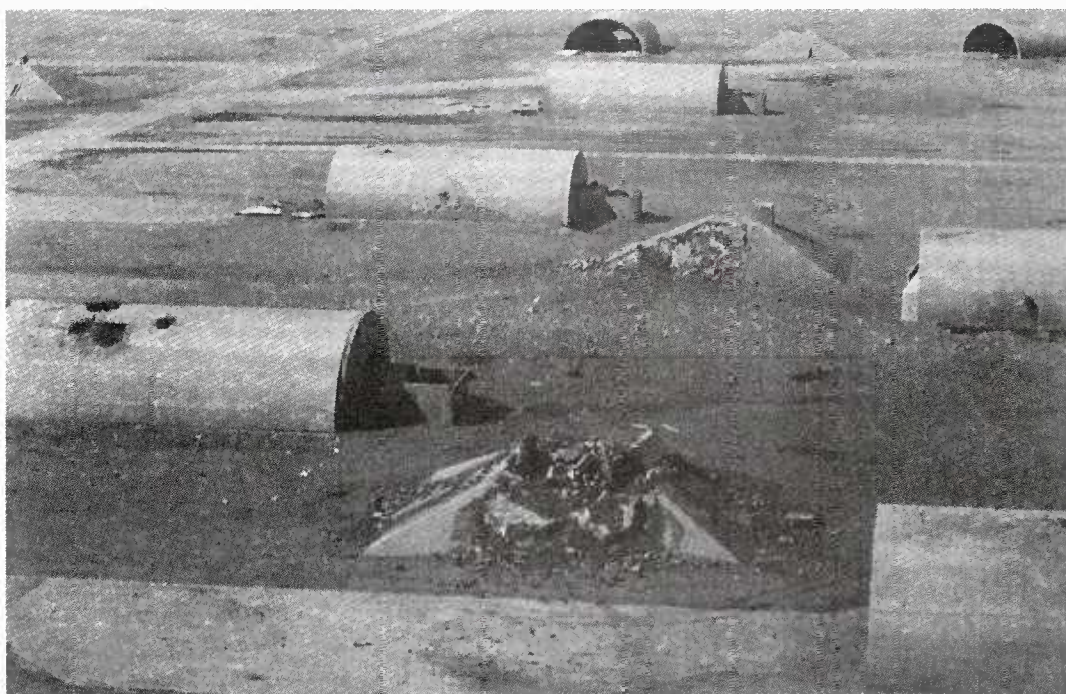


Figure VI-10

Exterior Shows Little Damage, but Interior and Contents Are Destroyed.

Meanwhile, in further attempts to prevent the air force's annihilation, the Iraqis also dispersed their aircraft around airfields, onto public roads, into civilian neighborhoods, and even in the shadows of ancient historical structures. Perhaps they guessed Coalition aircra crews would not risk killing civilians or damaging historical monuments to destroy isolated aircraft. Although some dispersed aircraft were attacked during the remainder of the war, the Coalition considered them a low priority because they were difficult to service, launch, and maintain; they were effectively out of the fight. By 27 January, CINCCENT was able to announce the Iraqi Air Force was combat ineffective – air supremacy had been secured.



*Figure VI-11
Pinpoint Strikes Against Airfield Shelters and Personnel Bunkers.*

SEAD Operations

Establishment of air superiority in the KTO, planned as the second phase of the campaign, took place in conjunction with Phase I. The targets included Iraqi air defense weapons systems able to disrupt Coalition air strikes against Iraq and Kuwait. Particular emphasis was placed on enemy SAM systems, including mobile launchers, AAA, early warning and target tracking radars, and C2 links that tied these systems together. Phase II was a combined operation involving the aircraft of several Coalition nations as well as Army, Navy, USMC and USAF assets. EW aircraft, dedicated to SEAD missions, were the heart and soul of Phase II operations.

In the early days of the air campaign, EA-6Bs, A-6Es, and F/A-18s escorted large strike packages into southern Iraq. The F/A-18s, A-6Es, A-7s, and S-3s successfully used TALDs to saturate, confuse, and deceive the air defense system. This tandem combination of soft and hard kill capability proved successful – no Coalition losses to radar-guided SAMs occurred during SEAD escort.

EA-6Bs and EF-111s also were highly effective in jamming Iraqi low-frequency early warning and higher frequency target-track and acquisition radars throughout the early air campaign, providing an umbrella for strikes. This jamming tactic was

reduced as the war evolved because of the apparent success of HARMs and hard-kill weapons Coalition air forces delivered.

The carefully planned, large-scale SEAD operation, begun during the opening moments of the war, was successful. During the latter part of the war, many sites not destroyed by HARMs or bombs were wary about turning on radars for fear of being attacked. Although some target-acquisition and target-track radars were not destroyed, enemy radar activity decreased as the war progressed; consequently, the number of HARMs fired also declined. The captured commander of an Iraqi armored unit stated a fear of instant retaliation if his radars or radios were turned on. With this disruption of SAM and AAA radars, Coalition forces were able to operate at medium to high altitudes, staying out of the low altitude, highly lethal AAA and infrared (IR) SAM environment. SEAD helped degrade air defense capabilities and command links, stopping the effective flow of information throughout the Iraqi chain of command.

D + 7 through D + 13: Summary of Week Two (24 - 30 January)

As the bad weather that disrupted air operations during the first week of Operation Desert Storm cleared, the Coalition intensified its air attacks. The most notable aspects of week two operations were the interdiction of Iraqi LOCs in the KTO, the start of hardened aircraft shelter destruction, and the direct attacks on Iraqi forces in the KTO. Additional Coalition members began or increased their participation – the Qatari Emirates Air Force began flying combat missions and the FAF extended its combat operations into Iraq. Air attacks against strategic targets continued. The Iraqi strategic air defense system was so badly fragmented that only three of 16 IOC were fully operational. The anti-Scud effort continued unabated, although Iraq continued to launch Scuds at both Israel and Saudi Arabia. Coalition air losses were extremely light, with only three aircraft (an F-16, an AV-8B, and an RAF GR-1) lost to enemy action in seven days' operations. The Iraqi Air Force lost 11 aircraft in air-to-air combat.

On 25 January, Saddam Hussein began fouling the Gulf with millions of barrels of heavy, black crude oil. The damage inflicted through pumping crude oil directly into the Gulf was unprecedented. Iraq's intent may have been to block Coalition amphibious operations, or to threaten Saudi desalinization plants. Whatever the motive, the impact would have been even worse except for the Coalition's actions. Two F-111Fs used 2,000-lb GBU-15 bombs to destroy the pumping system and manifolds, cutting off the flow of oil into the Persian Gulf waters.

Air operations to cut Iraqi movements into the KTO began in earnest during week two. On the 27 January, eight bridges were dropped or substantially damaged. These strikes not only caused traffic backups, which themselves became lucrative targets, but also further degraded Iraqi C3 because some bridges carried

communications cables. Once again, the ability of Coalition aircraft, especially F-111Fs, A-6s, F-15Es, F/A-18s, and RAF GR-1 (in cooperation with RAF Buccaneers), to deliver PGMs with extraordinary accuracy was a key factor in this effort.

Also on 27 January, Coalition air planners increased emphasis on the isolation and destruction of the Republican Guard and Iraqi Army in the KTO. The Republican Guard, Iraqi armor, artillery, C3, and logistics throughout the KTO were marked for heavy attacks.

D + 12 through D + 14 (29 - 31 January – The Battle of Al-Khafji)

On 29 January, the Iraqis launched several small attacks into Saudi Arabia and captured the undefended, evacuated border town of Al-Khafji. Coalition air power played a key role in defeating these attacks, which ended with an important Coalition victory during the air campaign's third week. Other than Scud attacks on Saudi and Israeli cities, this was the only noteworthy Iraqi offensive action. Saddam Hussein's exact purpose is not known, although he might have sought to probe Coalition forces or provoke a large-scale ground battle. EPW reports show a major objective was to capture American troops. Although Iraqi forces occupied the nearly deserted town, their ultimate defeat said much about their combat capabilities 12 days into the air campaign (Coalition ground actions in Al-Khafji are discussed in more detail in Appendices I and J).

During the night of 29 and 30 January, Iraqi armored and mechanized infantry forces began several battalion-sized attacks against Coalition ground forces, including elements of the Saudi Arabian National Guard and USMC forces. The eastern most Iraqi force occupied the Saudi Arabian border town of Al-Khafji. Despite being outgunned by the heavier Iraqi forces, Coalition ground forces offered stiff resistance. Saudi M60 tanks destroyed Iraqi tanks and armored personnel carriers. Farther to the west at Al-Wafrah and across the southwestern corner of Kuwait, the USMC inflicted substantial losses on the Iraqis, using Light Armor Vehicles equipped with TOW anti-tank missiles.

The Iraqi forces were from the 5th Mechanized and the 3rd Armored divisions of the regular army, equipped with several hundred tanks and other armored vehicles, but they had no air support.

While Coalition ground forces were fighting the advancing Iraqis, Coalition air power had a major effect on the battle. While USMC helicopter gunships provided close-in fire support, a steady stream of Coalition fixed-wing aircraft struck the Iraqis. AV-8Bs, A-6s, and F/A-18s, working with OV-10 forward air controllers (FACs), delivered general purpose and cluster bombs against Iraqi troops near Coalition ground forces. A-6s used radar beacons broadcasting from special forces on the ground to guide their bombing of Iraqi artillery positions, while A-10s using Maverick missiles and LANTIRN-equipped F-16s using CBU-87 combined effects

munitions attacked armor and vehicles. Three AC-130 gunships from the 1st SOW delivered minigun and cannon fire against vehicles and armored personnel carriers; one AC-130 was shot down. The combination of dogged resistance by the ground forces and the constant pounding from Coalition air forces stopped the Iraqi advance.

During daylight on 30 January, Coalition ground and air forces continued to maul the Iraqis, demonstrating the degree to which Coalition military power was coordinated and integrated. That night, Saudi Arabian and Qatari armored elements launched a counter strike against the Iraqis holding Al-Khafji; by midday on 31 January, they had destroyed the remaining Iraqi forces in the town, taking several hundred EPWs.

On 30 January, two Iraqi divisions were detected marshaling for a follow-on attack into Al-Khafji. This offered Coalition air power a lucrative target and, shortly after nightfall, Coalition aircraft took full advantage of their night combat capabilities. Heavy Coalition air attacks were directed onto the two Iraqi divisions. B-52s dropped armor-sensing mines, AV-8Bs, A-6s, and F/A-18s delivered cluster and precision munitions, A-10s and F-16s fired Maverick missiles, and F-15Es and F-16s dropped combined effects munitions. In some cases, when Iraqi vehicles were found in columns, the first aircraft took out the lead and trail vehicles, trapping the rest of the vehicles for follow-on attacks. In another case, the Tactical Air Control Center used Airborne Warning and Control System aircraft to redirect a three-ship B-52 formation to strike Iraqi armor north of Al-Khafji. The strike caught more than 80 Iraqi vehicles in column and broke it apart, making it easier for other aircraft to destroy the rest of the column.

CENTCOM Messages and Unit Reports

This ended the ground engagements of the battle of Al-Khafji, but a lesser known aspect had taken place that night, 30-31 January, farther north, inside occupied Kuwait. During the daylight hours of 30 January, while Coalition aircraft conducted tactical strikes on Iraqi forces in contact with Coalition ground forces, manned and unmanned reconnaissance, and intelligence assets gathered a clearer picture of what was going on behind the leading Iraqi elements. New reconnaissance technologies such as the TR-1, Joint Surveillance Target Attack Radar System (JSTARS), and Navy and USMC unmanned aerial vehicles played an important role.

For eight hours, throughout the night, Coalition air power systematically attacked and decimated the two divisions; by daybreak the divisions were retreating in disarray. If they had been able to attack into Saudi Arabia in good order, they might have precipitated a large-scale ground engagement and caused significant

Coalition casualties. Instead, they were repulsed. III Corps suffered numerous casualties and lost a substantial number of tanks and an undetermined number of other vehicles, according to combat unit and intelligence reports.

The Battle of Al-Khafji was important for the Coalition; the only ground offensive operation Saddam Hussein mounted had been defeated. The Pan-Arab forces had defeated the Iraqis in a pitched battle, launching a difficult night counterattack against enemy armor. The destruction inflicted on two Iraqi divisions by Coalition aircraft seemed to presage what awaited any Iraqi force that left dug-in defenses to conduct a mobile operation. The strategic significance: Any Iraqi unit that moved probably would be struck from the air. Any unit that remained in place eventually would be struck either from the air, or by the impending ground assault.

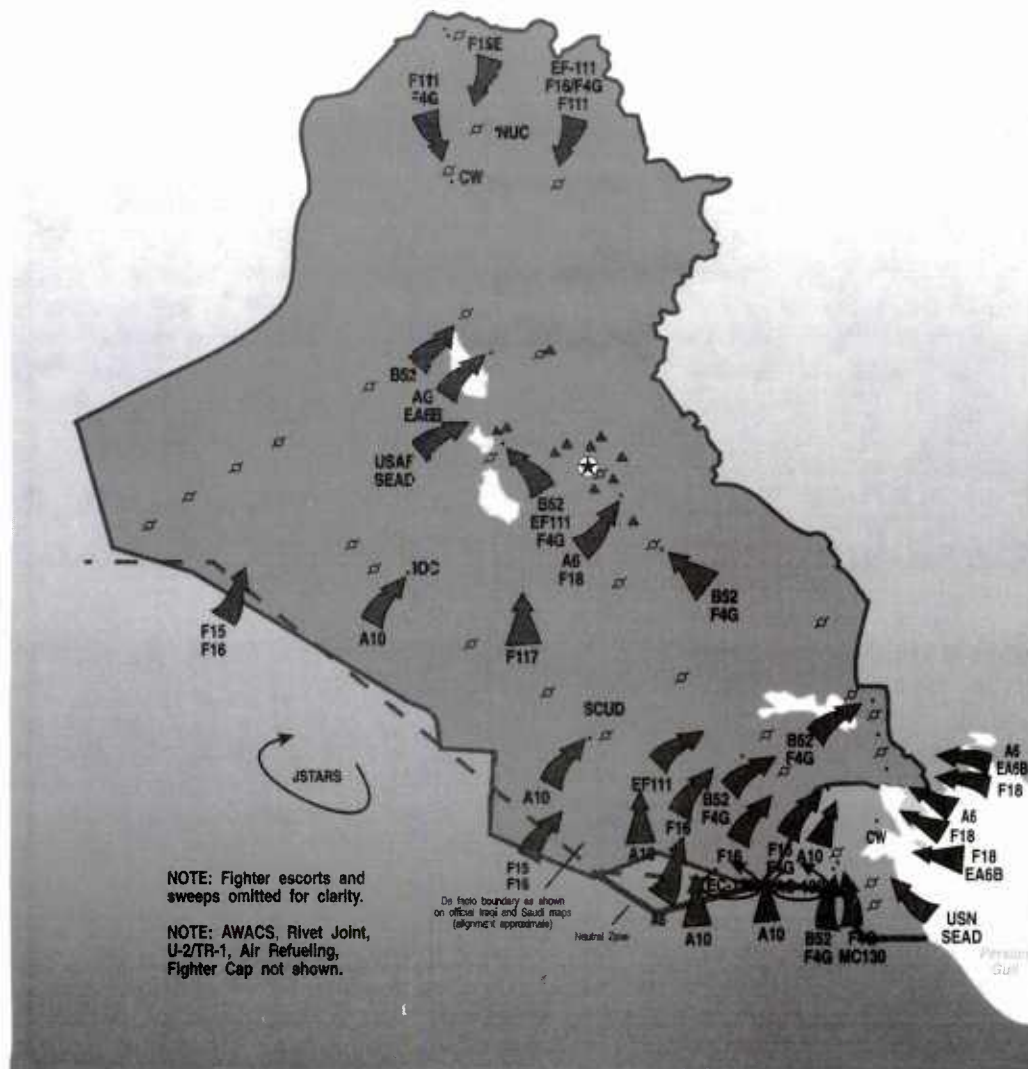
D + 20 (6-7 February – Emphasis on Degrading the Iraqi Army and Navy)

During the air campaign's 21st day, attacks continued across the theater, although CINCCENT was shifting the emphasis from strategic targets in Iraq to direct attacks on Iraqi forces in the KTO. Map VI-10 depicts the D + 20 planned sorties during 6 to 7 February, 1700 to 0025 hours. These attacks were roughly concentrated in four geographic regions – strategic targets in Baghdad; strategic targets in northern Iraq; Scud-related targets in the southwest and southeast of Iraq; direct attack on Iraqi forces in the KTO.

Attacks in northern Iraq were planned primarily against airfields and hardened aircraft shelters, CW and nuclear weapons storage and production facilities. As examples, a dozen F-111s from At-Taif bombed the nuclear production and storage facilities at Mosul (Al-Mawsil); JTF Proven Force F-111s hit communications transmitters and a railroad station near Kirkuk.

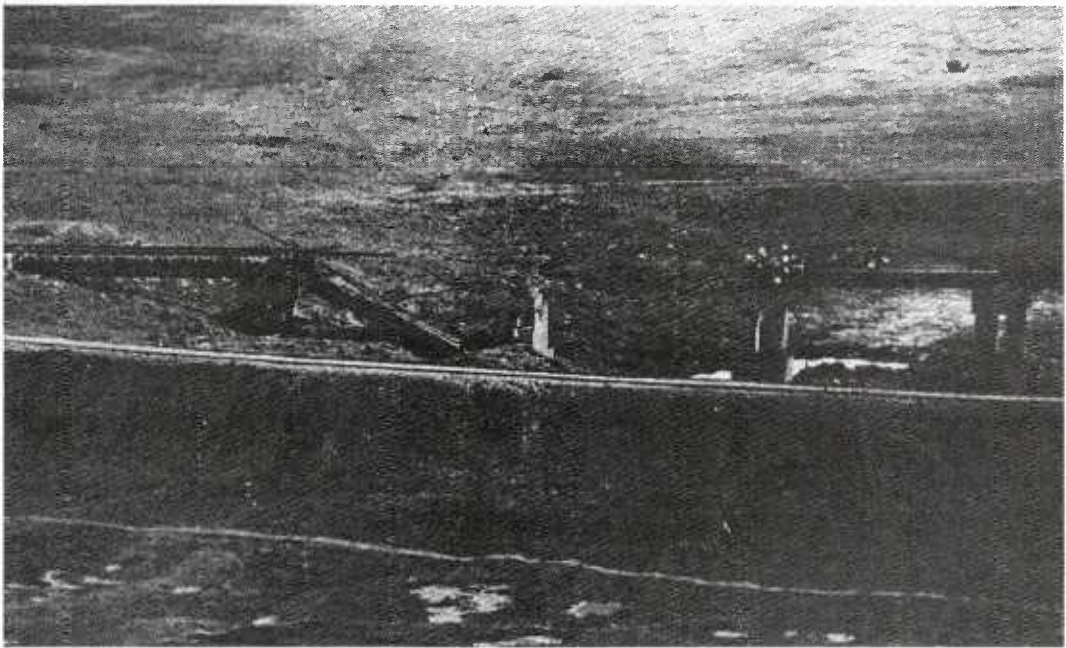
Attacks in and near Baghdad concentrated on leadership, C2, and airfields. F-117A sorties were planned against leadership command facilities and a Signals Intelligence facility in Baghdad. Other F-117As were scheduled to bomb leadership facilities and hardened aircraft shelters at Ar-Rashid and Balad Southeast airfields near Baghdad. B-52s were tasked to bomb the military production plant at Habbaniyah. More than a dozen A-6s and F/A-18s were scheduled to attack the SAM production and support facility at Al-Falliyah. Concurrently, Red Sea Battle Force aircraft were bombing targets north of Baghdad in the target complexes around Samarra.

During the same period, taking advantage of night detection and targeting systems, dozens of F-15Es and LANTIRN-equipped F-16s were scheduled to respond to JSTARS and AWACS, which would direct attacks on Scud launchers and transporters, and other targets of opportunity such as convoys and Iraqi Army forces.



Map VI-10

Meanwhile, waves of attacks were to take place in the KTO against Iraqi armored and mechanized units, personnel, artillery, headquarters facilities, C2 facilities, supply vehicles and bridges, and storage areas. MC-130s were to drop 15,000-lb BLU-82 bombs against front line Iraqi positions in southern Kuwait. Silkworm missile sites and an infantry division at Al-Faw were scheduled for attacks by A-6s and B-52s. Scores of sorties by B-52s, AV-8Bs, F-16s, A-10s, F/A-18s, A-6s, A-7s, and an AC-130 were directed to attack Iraqi ground forces in kill boxes inside Kuwait.



*Figure VI-12
Precision Strikes Against Rail Lines Reduced Iraqi Resupply in the
Kuwait Theater of Operations.*

Cutting Off the Iraqi Army

Air interdiction attacks were planned to reduce and slow resupply for the forces in the KTO, which were almost totally dependent on outside sources for supplies, including food and water. The Iraqis had extensive stockpiles in rear areas which were only moderately degraded by air attacks – but air attacks dramatically slowed resupply. The key interdiction targets were identified as about 40 of the 54 bridges across the Tigris and Euphrates rivers, along with railroad marshaling yards, fuel depots and supply concentration areas. Truck convoys also were hit.

Cutting the one rail line running south from Al-Basrah through Az-Zubayr to the KTO and the bridges over the Tigris and Euphrates rivers reduced the ability of the Iraqi army to resupply the theater. Once stockpiled supplies had been destroyed from the air or consumed, the Iraqi army would be unable to sustain itself.

Interdiction attacks reduced the flow of supplies from Baghdad to the KTO and made supply movements within the KTO extremely difficult and slow. By 4 February (D + 18), intelligence estimated the amount of supplies reaching Iraqi

— Solid Line Depicts Steady
Reduction in Resupply
Movement Capacity

Resupply Movements from Baghdad to Al-Basrah

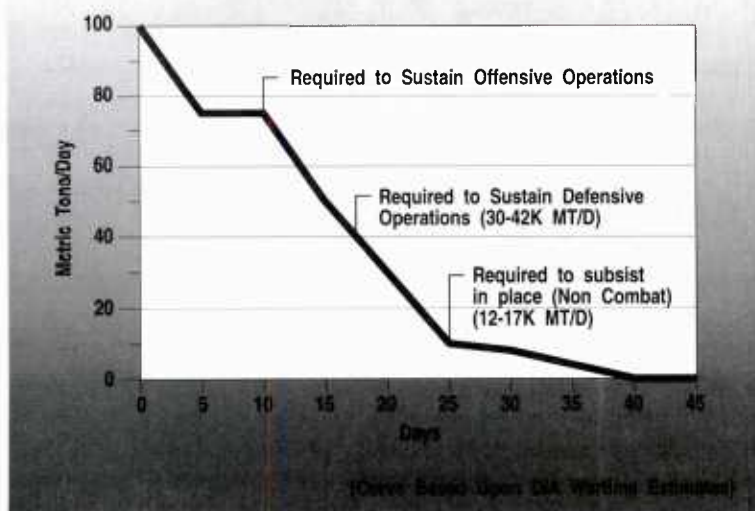


Table VI-3

This Chart Depicts the Estimated Reduction of Iraqi Resupply into the Kuwait Theater of Operations During Operation Desert Storm. It is Based Upon Wartime Battle Damage Assessments and Other Analyses by the Defense Intelligence Agency.

forces in the KTO was below the level needed to sustain combat operations. One captured senior Iraqi infantry officer said that one week after the bombing began, there was no more resupply. Food shortages apparently caused desertion rates to escalate. Air interdiction attacks left most of the Iraqi army in the KTO weak and demoralized, although frontline forces in Kuwait bore the brunt of these privations. These and other air attacks, according to Military Intelligence reports, psychologically disarmed some Iraqi soldiers.

Degrading the Iraqi Army

Beginning on D-Day, Coalition air power, naval gunfire bombardment from the Gulf, and ground based artillery and rocket systems methodically struck Iraqi armor, artillery, and infantry forces. During the war, more than 35,000 attack sorties were flown against KTO targets, including 5,600 against Republican Guard forces. Artillery, CPs, C2 facilities, armor, and logistics installations were hit daily. As the ground offensive approached, more sorties were allocated to battlefield

preparation and breaching operations. B-52s and USMC A-6s were used along enemy front lines in conjunction with MC-130s and other aircraft to deliver more than 21 million psychological warfare leaflets to warn Iraqi forces of what to expect if they did not leave Kuwait.

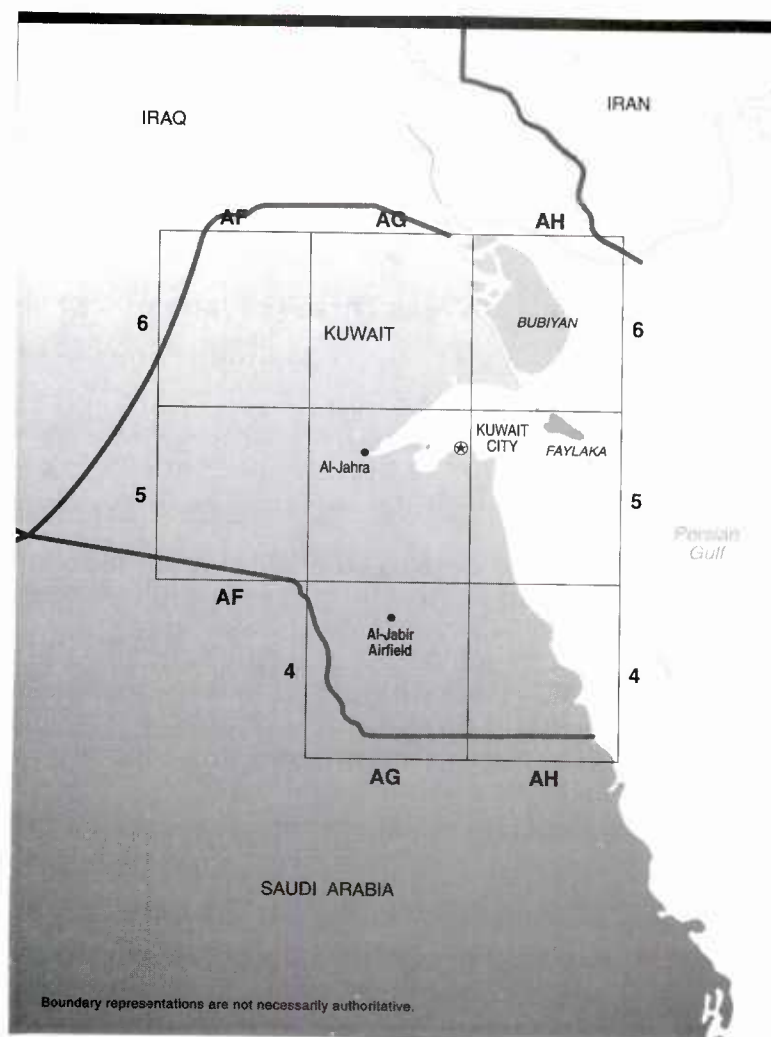
The executive officer of Marine Attack Squadron 311, and his division went on standby alert for the first morning of the war. At 0740 an OV-10 reported Iraqi artillery was firing on the Saudi town of Al-Khafji. The major led his four AV-8Bs, each loaded with four 1,000 pound bombs, Sidewinder missiles, and guns, north over the Persian Gulf. From their position 20,000 feet over the sea they could see smoke from burning oil tanks billowing 10,000 feet into the air. The OV-10 controller briefed the AV-8Bs, which then rolled in on six Iraqi artillery pieces. From out of the morning sun, the AV-8B pilots watched artillery tubes tossed high into the air from the impact of their bombs, then they headed back to base. The AV-8Bs' first combat mission was a success.

Marine Attack Group 13 (Forward) Commanding Officer Report

Kill Boxes

Locating and destroying the enemy in the tight confines of the KTO, while deconflicting Coalition air strikes, was a major concern. With the large number of Coalition aircraft operating over the KTO, especially in bad weather and the limited visibility caused by the smoke from burning oil fields, it was imperative to separate air strike elements, both to prevent the inefficiency of striking the same target and to prevent fratricide or mid-air collisions. Before Operation Desert Storm began, air planners devised a kill box system.

Kill boxes were assigned on the ATO and aircraft operating in them were allowed to locate and attack targets of opportunity. The boxes were 30 miles on a side (more than three times the size of New York City) and were subdivided into four quadrants to be assigned to a flight for a specified period of time. This system not only deconflicted the many Coalition aircraft operating in the region but also simplified the task of locating targets. When possible, airborne FACs and strike units were assigned repeatedly to a specific kill box increasing their familiarity with its features and terrain and making operations more effective. Within the I MEF area of operations, the kill boxes were further subdivided into maneuver boxes and fire support boxes, which simplified the task of coordinating and controlling air strikes at known locations.



Map VI-11
Kill Box Locations in the Kuwait Theater of Operations

Destroying the Iraqi Navy

The maritime campaign plan called for neutralization and destruction of Iraqi naval combatants and Iraqi mine layers. This effort was considered a prerequisite to moving Coalition naval forces into the northern Persian Gulf to support the anticipated ground offensive and a possible amphibious assault. (See Chapter VII, Maritime Campaign, for detailed description of naval operations.) To carry out these attacks, Navy commanders used, in addition to Coalition warships, carrier-based aircraft (A-6Es, F/A-18s, F-14s, and S-3A/Bs), MPA (P-3Cs and RAF Nimrods), helicopters (Navy SH-60Bs, RAF Lynxes, and Army OH-58Ds), and land-based

Coalition aircraft (CAF CF-18s). These assets used such weapons as Mark 80 series 500- and 1,000-lb bombs, 1,000-lb LGBs, Skipper air-to-surface missiles, Zuni 5-inch rockets, and MK-20 Rockeye 500-lb cluster bombs. Sea Skua helicopters launched air-to-surface missiles, and used .50 caliber and 20-mm aircraft machine guns. By 2 February, the Iraqi navy was assessed as being incapable of offensive action.

D + 14 through D + 20: Summary of Week Three (31 January - 6 February)

Week three focused attacks on the Republican Guard and other Iraqi forces in the KTO, with the overall emphasis shifting from strategic attacks towards KTO objectives. JTF Proven Force kept up the pressure over northern and central Iraq. The Iraqi Navy was eliminated as a fighting force.

Convoys jammed up behind destroyed bridges and made large numbers of Iraqi supply vehicles vulnerable to destruction. Newly implemented FAC techniques, such as operating special scout FACs within designated geographic kill boxes, increased the efficiency and destructiveness of battlefield air operations. Psychological Operations (PSYOP) were mounted to weaken Iraqi morale and increase desertion. These included operations such as leaflet drops to warn Iraqi units of impending attacks (to spur desertion), and the use of BLU-82 bombs to send a threatening signal to Iraqi ground soldiers.

Coalition losses during this week were again quite low, with only three planes (an A-10, an AC-130, and A-6E) lost to enemy action.

Continuing to Disrupt Iraqi C3

Some bridges between Baghdad and the KTO were used not only to move supplies but also as conduits for Iraqi communications cables. Bombing these bridges would help cut the supply line, and a link in the Iraqi military communications network into the KTO. The fiber optic network Saddam Hussein used to communicate with his field commanders also included many switching stations (one of which was in the basement of the Ar-Rashid Hotel) and dozens of relay sites along the oil pipeline from Baghdad through Al-Basrah to the south of Iraq. However, hitting some of these targets was not desirable, despite their military significance, because of possible collateral damage.

By mid-February, according to CENTCOM and EPW reports, communications between corps and division headquarters and their subordinate units along the Kuwaiti-Saudi border had become sporadic. In many instances, Iraqi commanders had to use messengers to communicate with other units and with different

command levels. Some captured Iraqi commanders indicated they had no communications at all with their headquarters for more than a week before G-Day.



Figure VI-13

An Iraqi Tank Dug-in and Camouflaged to Avoid Detection and Increase Survivability. The Effort Was Not Successful.

Armored Vehicle Destruction

It was necessary to reduce Iraqi armored and mechanized forces because they were a threat to Coalition ground forces during the final phase of the war. Not only were they the underpinning of Iraq's position in Kuwait, but they also strengthened Iraq's ability to threaten its Gulf neighbors.

Locating and destroying this equipment was difficult. In many cases, tanks and artillery pieces were spread out, dug in up to their turrets, sandbagged and surrounded by berms, trading mobility for supposed survivability.

Before the war, reconnaissance systems provided extremely accurate depictions of the Iraqi deployments, and planners realized there might be ways to exploit the Iraqis' visible and predictable deployment patterns. A F-16 pilot from the

614th TFS said "Flying in the area of the Republican Guard was a fighter pilot's dream come true. There were revetments full of tanks, armored personnel carriers, ammunition, AAA and artillery as far as the eye could see." In some areas, CENTCOM reported during the war that air power damaged or destroyed a large percentage of the Iraqi armored vehicles.



Figure VI-14
Scattered Debris of an Iraqi Tank Destroyed by a LGB. Some Aircrews Called This a "Plinked" Tank

Aircrews learned that desert conditions created some unique opportunities for weapons that use thermal imaging or IR seekers. In early February, F-111 crews returning to base near sunset noted the presence of buried armor could be detected by FLIR equipment, because the metallic surfaces cooled slower than the surrounding sand. On 8 February, F-111Fs tried a new tactic, that informally became known as "tank plinking," in which an F-111, carrying four GBU-12, 500-lb LGBs, located and bombed individual Iraqi tanks.

The JFACC was satisfied with the results of these efforts. Soon, A-6Es and F-15Es joined the fray and achieved similar results. There were several instances, according to JFACC staff reports, when two F-15Es carrying 16 bombs were believed to have destroyed 16 tanks. These tactics demonstrate the creativity of American airmen and are a good example of excellent technology being improved on by outstanding personnel. The F-111 was designed to conduct long-range, strategic bombing runs, not to destroy tanks one by one. Yet when the need arose, crews responded and developed a tactic (permitted by air supremacy) that helped meet a vital objective. A-6Es and A-10s, on the other hand, do train for day and night attacks on armored vehicles.

The AGM-65 Maverick missiles (fired from A-10, F-16, AV-8, and F/A-18) had electro-optical, IR, or laser seekers, and were effective against tanks. The Coalition fired more than 5,100 AGM-65s; A-10s fired 4,801. In fact, more than 90 percent of the tank kills credited to the A-10 were achieved with IR Mavericks and not with its 30mm GAU-8 gun. (This was in part a factor of the Iraqi AAA threat, which forced the aircraft to operate at altitudes where the gun was less effective.) More importantly, the innovative and aggressive use of PGMs sped the destruction of Iraq's armored forces in the KTO. (For more details on AGM-65, see Appendix T.)

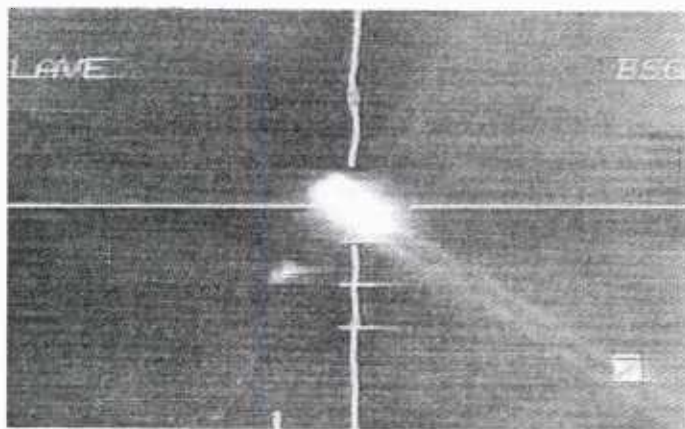


Figure VI-15
An AGM-65 (Maverick), at Lower Left of
Target, Just Before Impact

Tanks Abandoned

An Iraqi officer commented that during the war with Iran, the tank had been the soldier's friend, keeping him safe from enemy fire during cold desert nights. During the Operation Desert Storm air campaign, the tank was his enemy because high flying aircraft could destroy it without warning, even at night. As a result, soldiers would leave their vehicles and live in trenches a hundred yards away. Some US ground forces commanders reported that many enemy tank crews had abandoned their tanks presumably in part because of Coalition air and artillery attacks. We do not know if this was a widespread phenomenon.

Psychological Operations Impact

Millions of PSYOP leaflets were dropped; they called on the Iraqis not only to surrender, but also warned them to stay away from their equipment because it was the target of Coalition air strikes. Most leaflets were dropped by MC-130s. F-16s and other aircraft flew several missions a day carrying the MK 129 leaflet container, showering the Iraqi troops with messages and warnings. USMC A-6s dropped another version of the leaflet in Kuwait. UH-1N used loudspeakers and Arab linguists to convince Iraqi soldiers to surrender along the Kuwait border. One leaflet depicted a mosque and a schoolyard, in which Saddam Hussein had liberally interspersed tanks, AAA guns, and other military equipment. The message to the Iraqi soldier was that Saddam Hussein was deliberately endangering their religion and families.

The detonation of several 15,000-lb bombs, dropped from MC-130 special operations planes, also seemed to have a psychological effect on Iraqi troops. Senior Iraqi officer EPWs frequently commented their troops also were terrified of B-52s, and could clearly see and hear their strikes, even when miles away. (PSYOP are discussed in greater detail in Appendix J.)

CINCCENT assigned ARCENT responsibility for estimating attrition inflicted by aerial attack on three types of Iraqi ground equipment. Table VI-4 shows the estimates that ARCENT prepared during the war of attrition. These estimates were among several tools used by CINCCENT in making his decision on when to begin the Offensive Ground Campaign. The objective of the battlefield preparation phase of the air campaign was to reduce Iraqi capabilities in the KTO by about 50 percent in preparation for ground operations. Consequently, BDA methodology was focused on developing estimates of Iraqi equipment that contributed to those capabilities. In this methodology, the estimates began by using flying unit reports of equipment destruction. A-10, F-111, and F-15E reports accounted for most ARCENT counted claims, although other aircraft also were involved. Pilot reports had to be supported by either an aircraft generated video tape recording (VTR), or imagery produced by other sources. The unit's mission reports and imagery were reviewed by a Ground

Leaflet Samples



Figure VI-16

Samples of Psychological Operations Leaflets Dropped During Operation Desert Storm. The Arabic Script on the Reverse of the 25 Dinar Note (With Saddam Hussein's Likeness) Reads, "If you want to escape the killing, be safe, and return to your families, do the following things: 1- Remove the magazines from your weapons; 2- Put your weapon over your left shoulder with the barrel pointed down; 3- Put your hands over your head; 4- Approach military positions slowly. Note: Beware of the minefields sown along the border. Now, use this safe conduct pass. The Iraqi soldiers who are carrying this pass have indicated their desire for friendship, to cease resistance, and to withdraw from the battlefield. You must take their weapons from their hands, afford them proper treatment, provide food and water, and render any needed medical treatment."

Liaison Officer (GLO). If the GLO confirmed the claim, ARCENT then adjusted the estimates to account for imprecision in the pilot reports and the imagery. For example, an A-10 mission report of a destroyed tank was counted as one third of a tank destroyed. An F-111 report would be counted as one half of the report's claim.

EQUIPMENT DEGRADATION IN KTO BEFORE G - DAY

(Historical/Cumulative)

	<u>TANKS</u>	<u>APCs</u>	<u>ARTILLERY</u>
Original	4,280	2,880	3,100
22 Jan	14	0	77
27 Jan	65	50	281
01 Feb	476	243	356
06 Feb	728	552	535
11 Feb	862	692	771
16 Feb	1,439	879	1,271
21 Feb	1,563	887	1,428
23 Feb	1,688	929	1,452
24 Feb	1,772	948	1,474

Table VI-4

Estimates Prepared During the War by Army Component, Central Command, of Iraqi Equipment Degradation in the Kuwait Theater of Operations (Historical/Cumulative)

These adjustment factors were changed several times during Operation Desert Storm. BDA methodology is addressed in more detail in this chapter in the section entitled, "Evaluating the Results of the Air Campaign."

D + 21 through D + 27: Summary of Week Four (7 - 13 February)

Week four maintained the emphasis on attacking Iraqi forces in the KTO. It was notable for the full implementation of tank plinking attacks on enemy armor forces, and for a strategic attack on an alternate military command bunker in which, regrettably, Iraqi civilians were killed.

Because of Coalition air superiority, the Iraqi Air Force was unable to gather intelligence about, or interfere with, the westward flanking movement Coalition ground forces were making as they prepared to execute the ground offensive. The air campaign had degraded the combat effectiveness of major parts of the Iraqi Army in the KTO.

The Strategic Air Campaign continued, although at a lower level of effort because of the focus on direct air attacks on deployed Iraqi forces. After four weeks of intense air attack, Iraq was strategically crippled. Its navy had been eliminated as an effective combat force, much of its air force either interned in neutral Iran or destroyed in Iraq, and its strategic air defenses neutralized. Iraq's forces and military capabilities were vulnerable to Coalition air power. The national electric grid had collapsed and refined oil products production halted. NBC facilities and systems had been struck, and Iraq's ability to produce CW munitions and agents badly damaged. Based on the reduced frequency of Scud launches after mobile Scud-hunting air operations began, the combined effects of the counter-Scud effort and the continued degradation of Iraqi military capabilities appeared to reduce Iraq's ability to launch missiles. Table VI-10 shows that during the first 10 days of Operation Desert Storm, Scud launches averaged five a day; during February, the average was slightly more than one a day.

Careful targeting and use of PGMs minimized collateral damage and civilian casualties, reflecting US policy that Saddam Hussein and his military machine, not the Iraqi people, were the enemy. Regrettably, there were civilian casualties. One of the more publicized incidents was the destruction of the Al-Firdus district bomb shelter and alternate military CP in Baghdad on the night of 13-14 February. The Al Firdus bunker originally was constructed as a bomb shelter, but had been modified to serve as part of the national C3 network providing C2 of Iraqi forces.

When Coalition intelligence sources reported the bunker had been activated and its communications capabilities were being used by senior Iraqi military officials, Al Firdus was placed on the MAP. The attack was carried out by two F-117s, which each dropped one case-hardened penetrating 2,000-lb LGB, which set the bunker afire and destroyed it. Unfortunately, Iraqi authorities had permitted several hundred civilians into the facility, many of whom were killed or seriously injured. Intelligence had reported there were no civilians using the bomb shelter facilities. The resultant loss of civilian life led to a review of targeting policies, which were determined to be proper. (See Appendix O, The Role of Law of War, for further discussion.)

Coalition aircraft losses remained low during the week's operations. Two AV-8Bs and an RSAF F-5 were shot down. Iraqi air-to-air losses also were light (five aircraft shot down) because they continued to avoid combat.

D + 28 through D + 34: Week Five (14 - 20 February)

During Week Five, heavy attacks continued to focus on Iraqi forces in the KTO, while operations against strategic targets and the SEAD effort continued. Iraq's strategic air defenses remained quiescent, with only six of the more than 70 operations centers and reporting posts active. JTF Proven Force struck NBC and missile production facilities in Kirkuk and Mosul in northern Iraq. The counter-Scud

effort continued with direct attacks on suspected Scud launch vehicles, mining and bombing of suspected launch and hide areas, and airborne alert sorties to search for targets of opportunity. These efforts appeared to make Scud movements more dangerous and probably narrowed the mobile launchers' operating areas.

Interdiction of LOCs leading into the KTO continued, as Coalition aircraft attacked pontoon bridges, which replaced previously destroyed fixed bridges. The Iraqis' heavy vehicle losses led to the use of civilian vehicles, even garbage trucks, to transport supplies to the KTO.

The emphasis was now shifting to attacks on front line Iraqi units and direct battlefield preparation for the impending ground offensive. While the antiarmor effort continued to damage or destroy a number of armored vehicles every night, other aircraft struck front line defenses and vehicles during the day. AV-8Bs dropped napalm on Iraqi fire trenches by day while, after dark, F-117s destroyed the pumps that supplied crude oil to the trenches. B-52 mine-breaching strikes continued, while MC-130s dropped the giant BLU-82.

The greatest threat to Coalition aircraft remained ground-based defenses; during the week, the Coalition lost five aircraft: An OA-10, two A-10s, an F-16 and an RAF GR-1. The loss of two A-10s on the same day while attacking the same Republican Guard target led to restrictions on the use of A-10s in the higher threat areas. Again, due to the Iraqi Air Force's almost total incapacitation in the face of Coalition air supremacy, the remaining fixed-wing force did not fly any combat sorties. Many Iraqi EPWs commented on the lack of air support they received during the war.

Summary of the Air Campaign, on the Eve of the Offensive Ground Campaign

The Operation Desert Storm air campaign helped isolate Iraq's leadership, seriously degraded the ability to conduct effective offensive and defensive operations, and reduced the threat to regional stability and security. Nearly 100,000 combat and support sorties were flown and 288 TLAMs and 35 ALCMs launched before G-Day. Of all sorties flown, 60 percent were combat missions. Damage to Iraqi forces was extensive, and Iraqi C2 was disrupted radically. In some cases, corps, division and brigade commanders lost touch with their commands. Moderate amounts of equipment and supplies Iraq positioned to support the KTO were destroyed, and the road nets on which replenishment had to pass were degraded. Interdiction operations against fielded forces during Phase III sapped Iraqi forces' morale – according to intelligence reports in the week before the ground offensive, confirmed by subsequent reports from captured Iraqi officers, desertion rates were substantial. Phase III greatly reduced Saddam Hussein's ability to bring the strength of his army to bear against the Coalition forces. At the end of a month of bombardment, Iraqi forces remained in Kuwait; however, most were in poor

condition with heavy desertions, low morale, and a severely degraded capability to coordinate an effective defense.

By G-Day, CENTCOM intelligence estimated Iraqi front line divisions had been reduced in effectiveness by approximately 50 percent due to desertion, supply degradation, and casualties the air campaign inflicted. Air attacks had been so effective that some Iraqi forces in the KTO were largely immobilized, cut off from effective C2, increasingly isolated from their supply sources, and demoralized. Not only were the front line forces unaware of the overall situation, but some Iraqi leadership and command elements also were unaware of the condition of their forces. CENTCOM estimated the combat effectiveness of Iraqi forces, before G-Day, was reduced by approximately 25 percent in the rear (which principally were the more potent Republican Guard forces), and by about half in the front echelon of regular army units. The Republican Guards were not attacked more heavily because of targeting priorities, as well as resource and BDA limitations. Nonetheless, when Coalition ground forces launched their offensive, they were met by an Iraqi army already demoralized and severely degraded in combat effectiveness. The CJCS subsequently said, "...air power took a terrible toll, not only by destroying equipment, but by breaking formations and breaking the will of the Iraqi armed forces."

D + 38 (24 February – The Strategic Air Campaign Continues, and Air Operations Begin in Direct Support of the Offensive Ground Campaign)

Overview

During the Offensive Ground Campaign's four days, strategic air operations continued throughout Iraq and Kuwait. RAF GR-1s and Buccaneers, escorted by F-4Gs, bombed hardened aircraft shelters at Tallil and Jalibah airfields. A large package of F-16s and F-4Es escorted by F-15s, EF-111s, and F-4Gs attacked the Al Mawsil military research and production facility in northern Iraq. F-16s bombed the Shahiyat liquid fuel research and development facility. F-15Es sat ground alert and flew airborne alert ready for rapid response to Scud targeting by JSTARS and other surveillance systems. LANTIRN-equipped F-16s also flew in response to JSTARS target advisories during the night. B-52s bombed C3 sites in southern Iraq.

Interdiction attacks also continued to disrupt the movement and resupply of Iraqi forces in the KTO. F-16s and A-10s, responding to JSTARS targeting, flew armed reconnaissance along Iraqi roads. Restrikes were conducted against bridges to curtail Iraqi reconstruction.

Battlefield air attack sorties increased to support ground forces. On G-Day, scores of ground attack aircraft assigned to kill boxes attacked artillery, armor, APC, supply vehicles, CPs, and troops. F/A-18s and A-6s with EA-6B SEAD, E-2 early

Battlefield Air Operations

Coalition air forces provided invaluable assistance to CINCCENT's ground scheme of maneuver. But the ground offensive's speed required innovative actions beyond what is considered to be the norm for combined arms operations. For example, determining the exact position of the forward edge of Coalition ground forces was difficult because they moved faster than anticipated. Ground liaison officers, air liaison officers, and airborne C2 posts (such as FACs, AWACS, and ABCCC) worked to deconflict the movements and attacks in the KTO. In effect, each attack was deconflicted on a case-by-case basis.

Air attacks used in conjunction with ground forces will be discussed in three categories. These operations over and around the battlefield can be described as interdiction, close air support (CAS), and breaching operations support.

Air Interdiction

By the ground offensive's start, Coalition air interdiction of Iraqi LOCs had destroyed key logistical system elements. Interdiction of supply lines to the KTO reduced deliveries to a trickle. These and direct attacks on Iraqi supply points and transportation resulted in major supply shortages for fielded Iraqi forces in Kuwait, although the Republican Guards and other high priority units in Iraq appeared to suffer less. The effort to disrupt, delay, and destroy enemy forces and capabilities before they could be used against friendly forces continued, but the focus shifted to Iraqi systems nearer to Coalition forces. Air power engaged Iraqi supply elements that attempted to move food, fuel, and ammunition. Combat elements that attempted to shift position, retreat or advance, were identified by Coalition reconnaissance and surveillance systems such as U-2, TR-1, JSTARS, and RC-135s and were subjected to air attack. Iraqi forces thus were on the horns of a dilemma: if they remained in position, they would be struck either from the air or by advancing Coalition ground forces; if they tried to move, they made themselves extremely vulnerable to patrolling Coalition aircraft, including attack helicopters.

One of the more important targets for Coalition aircraft was Iraqi artillery, because of its long range and ability to fire chemical projectiles. Two days before ground operations started, air planners, in response to a request from the VII Corps commander, switched the F-111s from the Republican Guard to the Iraqi 47th Infantry Division artillery, because that unit had an abnormally large artillery component (204 instead of the normal complement of 72 pieces) and was in a position to fire on either the Egyptian forces or VII Corps. In less than a day, many artillery pieces were destroyed as a result of airstrikes and artillery raids. Thirty-six hours later, when the VII Corps began its breaching operation, Iraqi artillery near the breaching site was ineffectual, and the Corps completed breaching operations with minimal casualties. Large numbers of Iraqi soldiers began surrendering to advancing

Coalition forces throughout G-Day. By day's end, more than 8,000 had been collected, and their condition said much about the effectiveness of Coalition efforts. Many were weak from hunger, sick, lice-infested, demoralized or in shock.

Another example of interdiction operations occurred on the night of G + 2, when JSTARS detected large numbers of Iraqi vehicles moving from Kuwait towards Iraq. III Corps, trying to reach Al-Basrah and avoid destruction by I MEF and the Arab Joint Forces Command-East (JFC-E) forces, became enmeshed with Iraqi occupation forces in Kuwait City. North and west of Kuwait City the roads and causeways formed a bottleneck and the mass of vehicles presented a lucrative target for Coalition airpower. Coalition commanders, aware that forces escaping with their combat equipment could regroup and pose a danger to Coalition ground forces, focused repeated air strikes in the area. Striking first at night, then into the daylight hours, Coalition aircraft destroyed a large number of vehicles, many abandoned by their crews who fled into the desert.

Military formations – particularly armored units in the open desert – exposed to constant attack from the air suffer losses and degradation of combat effectiveness. The many different Coalition air power elements served to magnify this effect on the Iraqis. One Iraqi officer stated he surrendered because of B-52 strikes. "But your position was never attacked by B-52s," his interrogator exclaimed. "That is true," the Iraqi officer stated, "but I saw one that had been attacked." After one BLU-82 bombing of an Iraqi minefield, leaflets were dropped on Iraqi troops that had witnessed the explosion, warning they would be next. Not knowing the bomb had been targeted on a minefield, mass defections resulted, including virtually the entire staff of one Iraqi battalion.

Close Air Support

The USAF, Navy, and USMC provided FACs and air naval gunfire liaison companies (ANGLICOs) to select and identify targets, and to guide strike aircraft to them; this procedure is the principal means for controlling CAS. The USAF and USMC used FACs with the ground forces, and in a liaison role with non-US Coalition ground forces; for example, a USAF officer accompanied the 4th Egyptian Armored Division. The USMC positioned tactical air control parties from 1st ANGLICO team with JFC E.

During the months before Operation Desert Storm, Coalition aircraft flew simulated CAS sorties under the direction of the 1st ANGLICO FACs. This practice paid dividends at the battle of Al-Khafji. Airborne FACs also were used extensively; the USMC used the F/A-18D and the OV-10, while the USAF used OA-10s. The F-16s also performed FAC duties informally called Killer Scouts.

Locating and marking targets in this phase of the air war was crucial to effective CAS. FACs marked targets with a white phosphorus rocket or a laser

designator so attack pilots could find and strike dug-in artillery, armor and troops. FACs sped and improved the effectiveness of attacks on ground forces in the KTO.

The basic CAS plan during the ground offensive involved multi-sortie surge operations, particularly by those aircraft designed for CAS operations and operating from forward operating locations (FOLs) near the battlefield, the A-10s and AV-8Bs. Since Iraqi artillery posed the greatest immediate threat to ground forces penetrating the minefield breaches and obstacle belt, it was a prime Coalition aircraft target. USMC aircraft began increased operations into Kuwait two days before the ground offensive. Operations were based on a system in which fixed-wing aircraft were launched according to schedule, instead of against specific targets, and flew to a series of stacks or holding points. AV-8Bs, for example, flew to a stack east of the battle zone and orbited for approximately 20 minutes while awaiting tasking. If no CAS were needed at that moment they were sent deeper into the KTO to receive targeting from a FAC in a kill box. During the daytime, a section of two USMC aircraft entered the stack every seven and a half minutes; at night, a section of A-6s or other USMC aircraft checked into the stack every 15 minutes. To the east and west, EA-6Bs orbited to provide jamming and EW support, effectively blocking Iraqi battlefield radars.

On 24 February, an Air Force captain leading a flight of four F-16s from the 10th Tactical Fighter Squadron was redirected to support a 16-member Special Forces (SF) team in trouble more than 135 miles from the flight's original target. The SF team was surrounded by a company-size Iraqi force. The lead pilot directed his flight to attack the approaching enemy troops. With disregard for intense enemy 23-mm and 37-mm anti-aircraft fire, his flight made multiple attacks, placing cluster bomb munitions on target – as close as 200 meters from friendly positions. On the last pass, while low on fuel, the captain put his bombs exactly on target, causing numerous enemy casualties and forcing the remaining enemy troops to retreat. Army helicopters extracted the SF team without a single Coalition casualty.

50th Tactical Fighter Wing Report

With the concurrence of the JFACC, I MEF used a high density air control zone (HIDACZ) to coordinate and control the large number of aircraft, artillery, and rockets within I MEF's AOR. Aircraft conducting interdiction or CAS missions within the HIDACZ worked with Marine Air Command and Control Systems for air traffic control and FAC handoffs. The HIDACZ size and shape was under continuous negotiation with the JFACC as other users requested the airspace. Despite some airspace dimensions restrictions, the HIDACZ effectively gave the Marine ground commander a flexible means of coordinating and controlling battlefield air attacks.

As G-Day approached, the JFACC modified the directions to Coalition pilots. Instead of remaining in the relative safety of the medium altitudes from which they

bombed strategic and interdiction targets, they were to press home their attacks at lower altitudes. However, the effects of Coalition operations against Iraqi forces before G-Day, and the overall light resistance by Iraqi forces, limited the amount of CAS Coalition ground forces needed.

Breaching Operations

Coalition ground forces south of Kuwait faced a series of formidable defensive positions the Iraqis built during the five months before Operation Desert Storm. Coalition air power was used in several ways to help disrupt these defenses. B-52s bombed the minefields with 750-lb M-117 and 500-lb MK-82 bombs; MC-130s dropped 15,000-lb BLU-82 bombs to create over-pressure and detonate mines. A few days before G-Day, USMC AV-8Bs dropped napalm on the Iraqi fire trenches and attacked the pumping stations to ignite and burn off the oil, while fuel air explosives also were used against minefields. F-117As dropped 500-lb LGBs on oil pipes and distribution points in the fire trenches. Despite the extensive bombing to reduce the size of the Iraqi minefields and obstacles, these bombing efforts were not always effective. Most ground units used their organic countermine and counterobstacle equipment to breach enemy minefields and obstacles.

Effect of Weather and Oil Well Fires

Air attacks were affected by the weather, which turned bad on G-Day and stayed that way until hostilities ended. Conditions varied from solid cloud cover with severe icing from the surface up to 35,000 feet, to crystal blue sky above a thick carpet of ground fog that totally obscured targets. This forced pilots to make choices about the feasibility of some missions. To acquire targets visually, pilots had to go under the cloud layer, which made them vulnerable to Iraqi ground forces and to air defense weapons. On the first day of the ground offensive the Coalition lost four airplanes to Iraqi ground fire. Some A-10 pilots noted their green aircraft were quite visible to ground forces, because the dark paint made them stand out against the overcast skies. Fortunately, the effect of these problems was ameliorated by the speed of the ground advance, the rapid collapse of the Iraqis, and the ceasefire.

Just before and during the Offensive Ground Campaign, Iraqi forces detonated charges placed around Kuwaiti well heads, pipelines, and oil facilities. Thick, viscous pools of crude oil many acres wide formed from some ruptured pipes while more than 700 oil wells burned furiously, sending great balls of flames and clouds of thick, greasy smoke into the air. The fumes and vapors were noxious and the clouds of smoke were a hazard to flying. Weapons also were affected. Sensitive optical devices such as seeker heads on missiles that earlier had been affected by gritty, windblown sand, also were affected by filmy drops of oil.

D + 35 through D + 42: Week Six (21-28 February)

During the four days before the ground offensive, the Coalition continued heavy emphasis on interdiction of the KTO and destruction of Iraqi forces in their defensive positions. Nearly 90 percent of all combat sorties were targeted into the KTO against armor, artillery, and other elements that threatened Coalition ground forces. According to CENTCOM rough estimates at the time, based only on pilot reports, air attacks on 23 February destroyed 178 tanks, 97 APCs, 202 vehicles, 201 artillery pieces or multiple rocket launchers, 66 revetments, buildings, and bunkers, and two AAA/SAM facilities.

Because of the Coalition ground forces' rapid advance, and the light resistance most ground elements met, relatively more air effort was expended on interdiction than on direct battlefield support. By G-Day, thousands of Iraqi soldiers had deserted, either returning home or crossing the border to surrender to Coalition forces.

Bad weather caused cancellation or diversion of many planned sorties, and forced many others to operate at lower altitudes and use attack profiles that increased their exposure to Iraqi air defenses. The combination of poor weather, the smoke and haze caused by Saddam Hussein's deliberate torching of hundreds of Kuwaiti oil wells, the fluid nature of the rapid ground advance, and the Coalition decision to operate and fight at night placed severe demands on Coalition forces and played a role in the few instances of fratricide that occurred.

Coalition air forces continued to strike strategic targets until the last moments of the war. Airfields were hit to prevent any Iraqi Air Force attempt to interfere with Coalition operations. Scuds remained a key target. Other attacks continued against NBC, missile production, and C3 targets, including a mission just before the cease-fire that used a specially developed hard-target penetration bomb (the 4,700-lb GBU-28) to destroy a leadership C3 bunker near At-Taji.

The Coalition lost eight aircraft during this final week of the war: Three AV-8Bs, one OV-10, one OA-10, one A-10, and two F-16s. Several US and UK troops were killed, wounded, or themselves captured in attempts to reach and rescue downed pilots. (CSAR Operations are discussed in Appendix J.)

RESULTS

Not all the Coalition advantages enjoyed during Operation Desert Storm will be present during the next conflict. However, all modern industrial and military powers share certain universal vulnerabilities. The technological advances that make them powerful also are their great vulnerabilities: these include computer dependent C3 systems; networked air defense systems and airfields; and easily

located sources of energy. When the key nodes are destroyed, such systems suffer cascading, and potentially catastrophic, failure.

"If there is one attitude more dangerous than to assume that a future war will be just like the last one, it is to imagine that it will be so utterly different that we can afford to ignore all the lessons of the last one."

Former RAF Marshal, Sir John Slessor
Air Power and Armies, 1936

The initial Operation Desert Storm air strikes attacked the entire target base nearly simultaneously to produce visible pressure and destructive effects against Iraqi centers of gravity. The highest initial priority was to establish air supremacy by degrading the Iraqi IADS, making enemy air forces ineffective, and preventing use of CW biological weapons. Achieving air supremacy allowed continuous air attacks with non-stealth aircraft against the complete range of targets. Stealth aircraft and cruise missiles allowed the Coalition to keep pressure on key leadership, as well as C2 nodes, in the more heavily defended areas, around the clock.

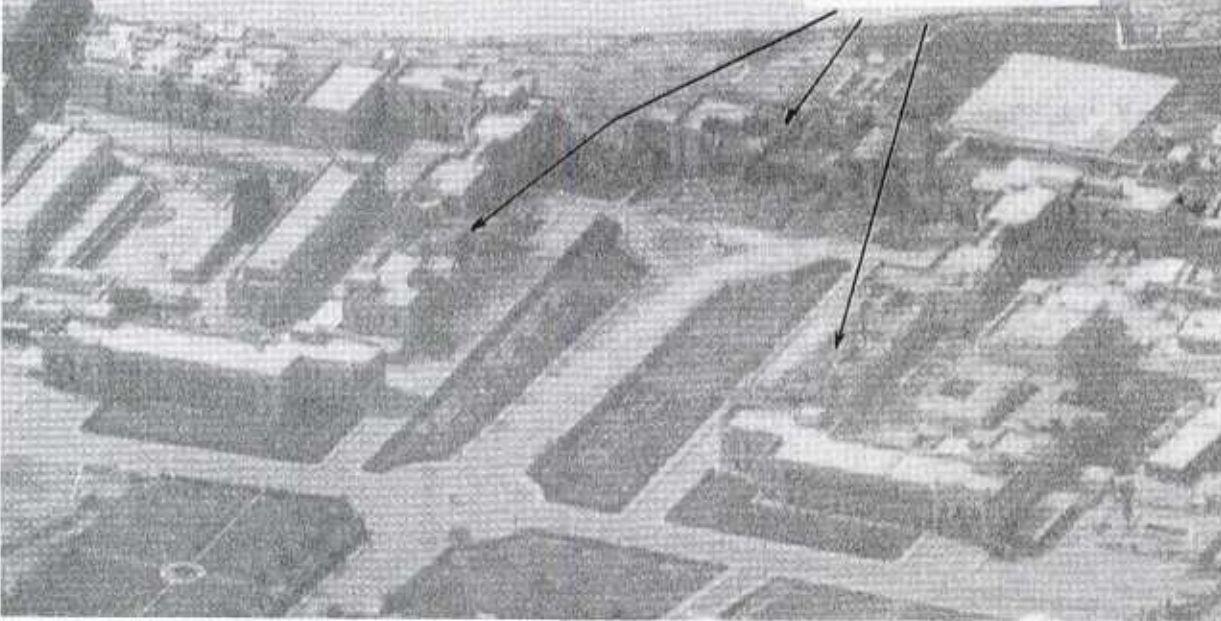
CINCCENT neutralized the enemy with decisive air attacks. Iraq's sophisticated air defense system was defeated by stealth, large packages of EW aircraft, decoy drones, and attack aircraft using PGMs and gravity weapons, while key nodes in the electrical power system, air defenses, C2 structure, and intelligence apparatus were attacked by stealth and conventional aircraft using PGMs and by cruise missiles. Scores of aircraft attacked Iraqi forces and facilities across the KTO and Iraq, using mostly gravity bombs and cluster bomb units, as well as PGMs (which constituted about 10 percent of the total munitions delivered). Saddam Hussein was unable to coordinate an effective response to the rest of Coalition military operations. What came after was not easy, and ground forces had to eject Saddam Hussein's forces from the KTO and secure the liberation of Kuwait, but air power set the stage and helped the Offensive Ground Campaign exploit a weakened enemy.

Assessments By Target Set

This section describes what air power, supported by some special operations and artillery attacks, accomplished by target set. These assessments cannot be definitive, because not all the data have been collected, analyzed, and examined in detail. For the most part, they must be both tentative and subjective because of the magnitude of Coalition air operations, difficulties with gathering records for each of some 60,000 attack sorties, and inaccessibility of enemy soldiers, equipment and facilities.

**BAGHDAD MINISTRY OF DEFENSE
10 MARCH 1991**

DAMAGED BLDGS



*Figure VI-17
Ministry of Defense, Baghdad (Post-Strike). A Crucial Leadership Facility.*

Leadership Command Facilities

A Strategic Air Campaign objective of overriding importance was the isolation and incapacitation of Saddam Hussein's regime. In Iraq's rigid, authoritarian society, where decision-making power is highly centralized in the hands of Saddam Hussein and a few others, destruction of the means of C2 has a particularly crippling effect on forces in the field. Bombing several leadership facilities, (i.e., places from which Saddam Hussein controlled operations), caused him and other important leaders to avoid facilities that were best suited for C3, and made them move often. This reduced the ability to communicate with their military forces, population, and the outside world. It also forced them to use less secure communications, thereby providing valuable intelligence.

Electrical Production Facilities

Attacks on Iraqi power facilities shut down their effective operation and eventually collapsed the national power grid. This had a cascading effect, reducing or eliminating the reliable supply of electricity needed to power NBC weapons production facilities, as well as other war-supporting industries; to refrigerate bio-toxins and some CW agents; to power the computer systems required to integrate the air defense network; to pump fuel and oil from storage facilities into trucks, tanks, and aircraft; to operate reinforced doors at aircraft storage and maintenance facilities; and to provide the lighting and power for maintenance, planning, repairs, and the loading of bombs and explosive agents. This increased Iraqi use of less-reliable backup power generators which, generally, are slow to come on line, and provide less power. Taken together, the synergistic effect of losing primary electrical power sources in the first days of the war helped reduce Iraq's ability to respond to Coalition attacks. The early disruption of electrical power undoubtedly helped keep Coalition casualties low.

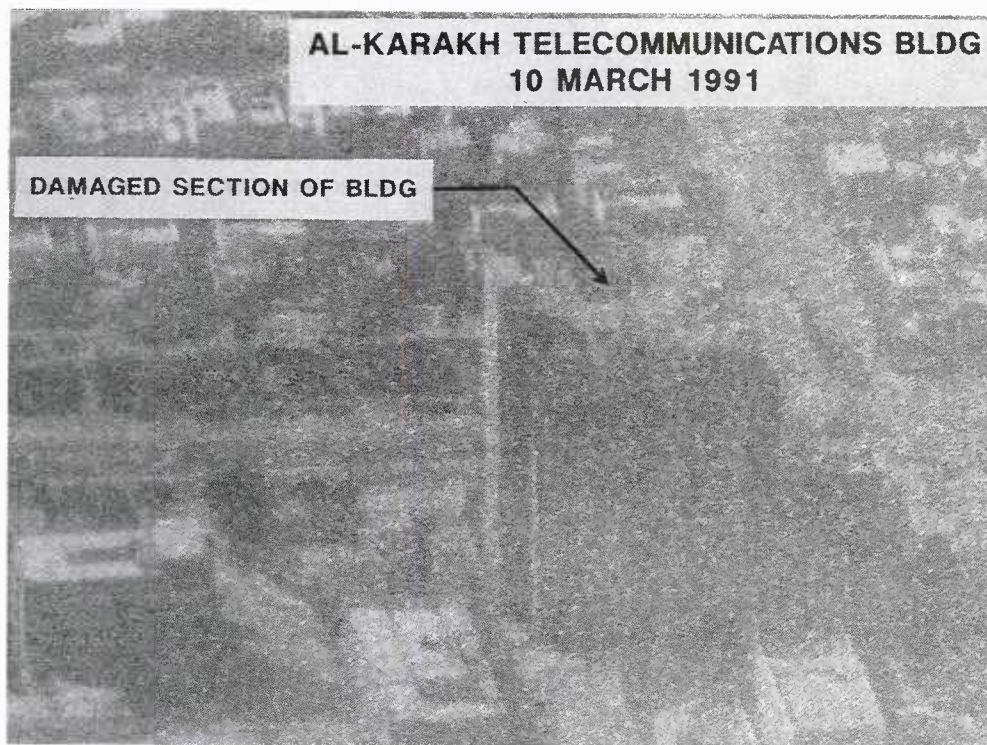
Coalition planners in the theater directed that the switching system be targeted, rather than the generator halls. There were several deliberate exceptions made to this policy. For the first three days, the ATO explicitly contained specific aimpoints for strikes against electrical production facilities. Subsequent to that, the specific aimpoints were only sporadically included. When wing-level planners lacked specific guidance on which aimpoints to hit at electrical power plants, they sometimes chose to target generator halls, which are among the aimpoints listed in standard targeting manuals.

Telecommunications and Command, Control, and Communication Nodes

Saddam Hussein's ability to transmit detailed, timely orders to his senior field commanders deteriorated rapidly. The physical destruction of the Iraqi C3 capability began before H-Hour with attacks on key nodes of the air defense and C3 systems. The destruction of the Iraqi Air Force headquarters, publicized by the CENTAF commander's press briefing in late January, was one of many attacks against Iraq's ability to control combat operations effectively.

In Iraq, the civil telecommunications system was designed to serve the regime – it was an integral part of military communications. For example, approximately 60 percent of military landline communications passed through the civil telephone system. Degrading this system appears to have had an immediate effect on the ability to command military forces and secret police.

The bombing campaign seriously degraded Iraq's national communications network by destroying Saddam Hussein's preferred secure system for communicating with his fielded forces. However, this national-level capability could



*Figure VI-18
Al-Karakh Telecommunications
Building, Baghdad (Post-Strike). To
Isolate Saddam Hussein from His Forces,
the Coalition Conducted Strikes Against
Key Communications Facilities.*

be repaired and thus needed to be attacked repeatedly. Also, redundancy was built into the national communications network; these other systems tended to be more vulnerable to eavesdropping but difficult to destroy because they included a dispersed network of CPs with radio transmission capability. These sites could be bombed if planners had precise targeting intelligence, but were difficult to destroy.

To deepen this isolation and incapacitation, telecommunications sites in Baghdad and elsewhere were attacked heavily during the first three days of the war. Internal radio and television systems also were attacked. The Iraqis had a reduced capability to broadcast outside the country and could broadcast only sporadically inside the country.

By G-Day, regular means of electronic communication were reduced dramatically. During the Offensive Ground Campaign, communications continued to deteriorate. This also greatly improved intelligence collection against Iraqi communications.

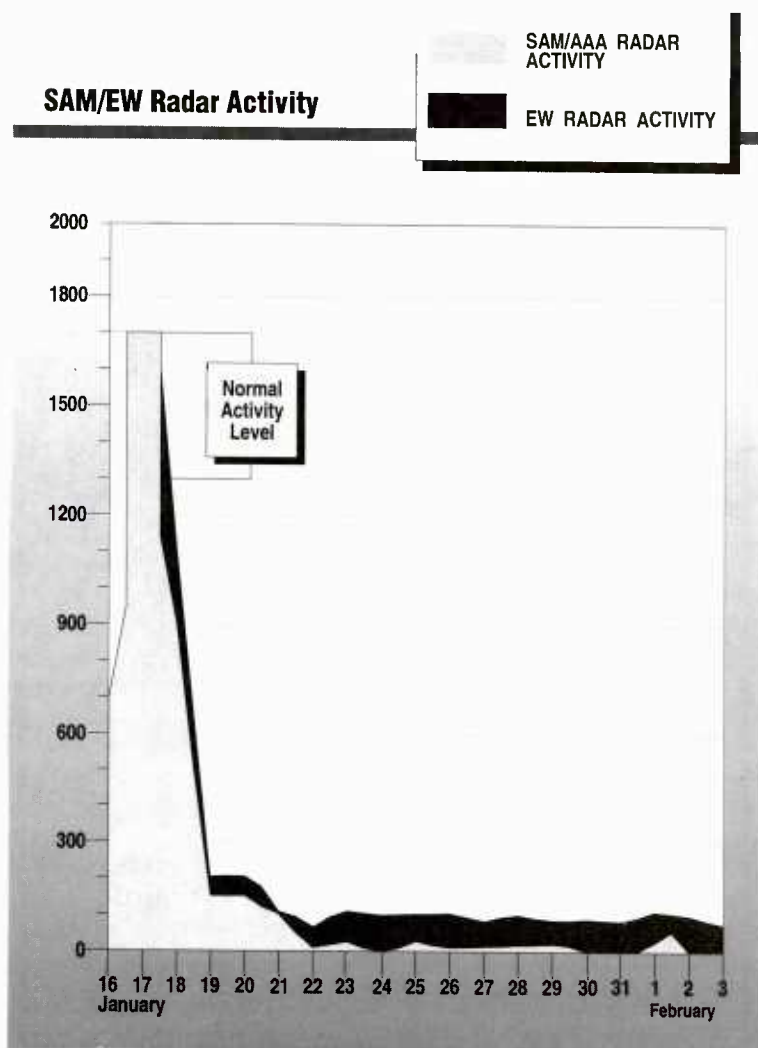


Table VI-5
Iraqi Air Defense Activity

Strategic Integrated Air Defense System

On the eve of the air campaign, Iraq's strategic IADS was dense, overlapping, and dangerous. It used a mix of Soviet and Western equipment, including radars, interceptor aircraft, SAMs, and AAA, and was tied together by a French-built, computerized C2 system, Kari. The AAA was either radar or optically guided; SAMs used either radar or IR guidance. The AAA was most dangerous below 12,000 to 15,000 feet, while Iraqi SAMs provided overlapping coverage from virtually ground level to above 40,000 feet. Coalition air operations neutralized most of the effectiveness of these systems through innovative tactics, technology, massive waves of aircraft, cruise missiles, SEAD, intelligence, and careful targeting.

Within hours of the start of combat operations, the IADS had been fragmented and individual air defense sectors forced into autonomous operations. Most hardened SOC and IOC were destroyed or neutralized within the first few days, markedly reducing the Iraqis' ability to coordinate and conduct air defense. The early warning radar net had been so badly damaged that the Iraqis were forced, in many cases, to rely on individual SAM battery radars to provide warning of attacks. After the first week, Coalition aircraft were able to operate at medium and high altitudes with virtual impunity; during the next three weeks, the Coalition lost only seven aircraft to Iraqi defenses. Not until the final few days of the war did air operations move down into the lower altitudes and higher threat posed by Iraqi battlefield defenses (handheld IR SAMs and small-caliber AAA, for example), and aircraft losses increased.

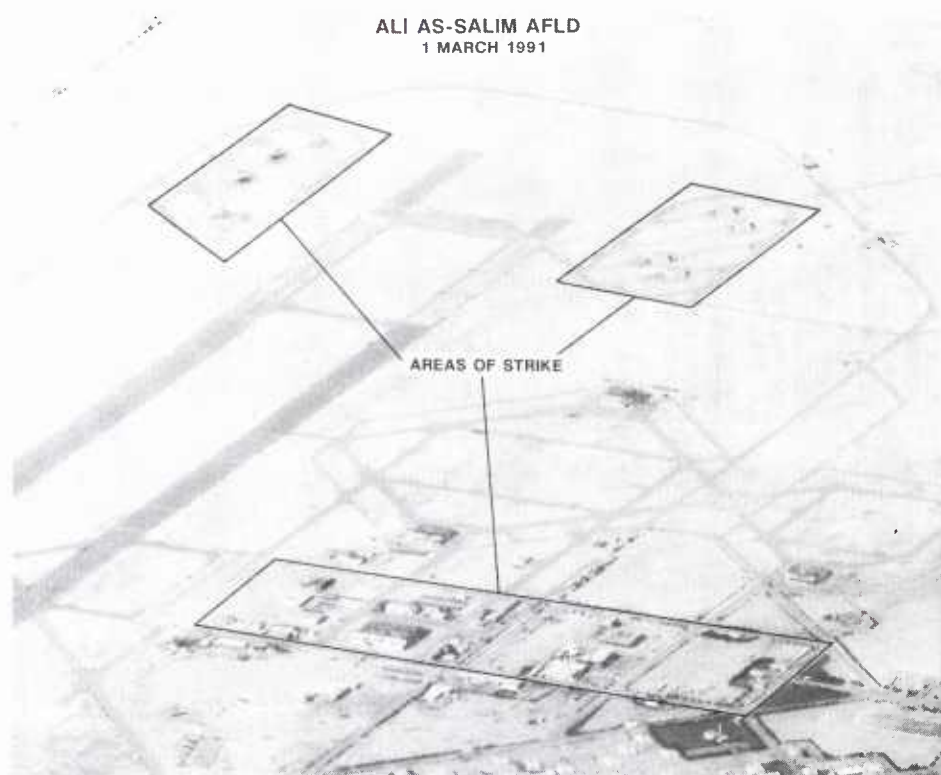


Figure VI-19

'Ali As-Salim Airfield, Kuwait (Pre-Strike). Photograph Shows Part of the Parallel Runways and Air Base Operations and Support Facilities (Area Shown is Approximately 1.5 Miles Square)

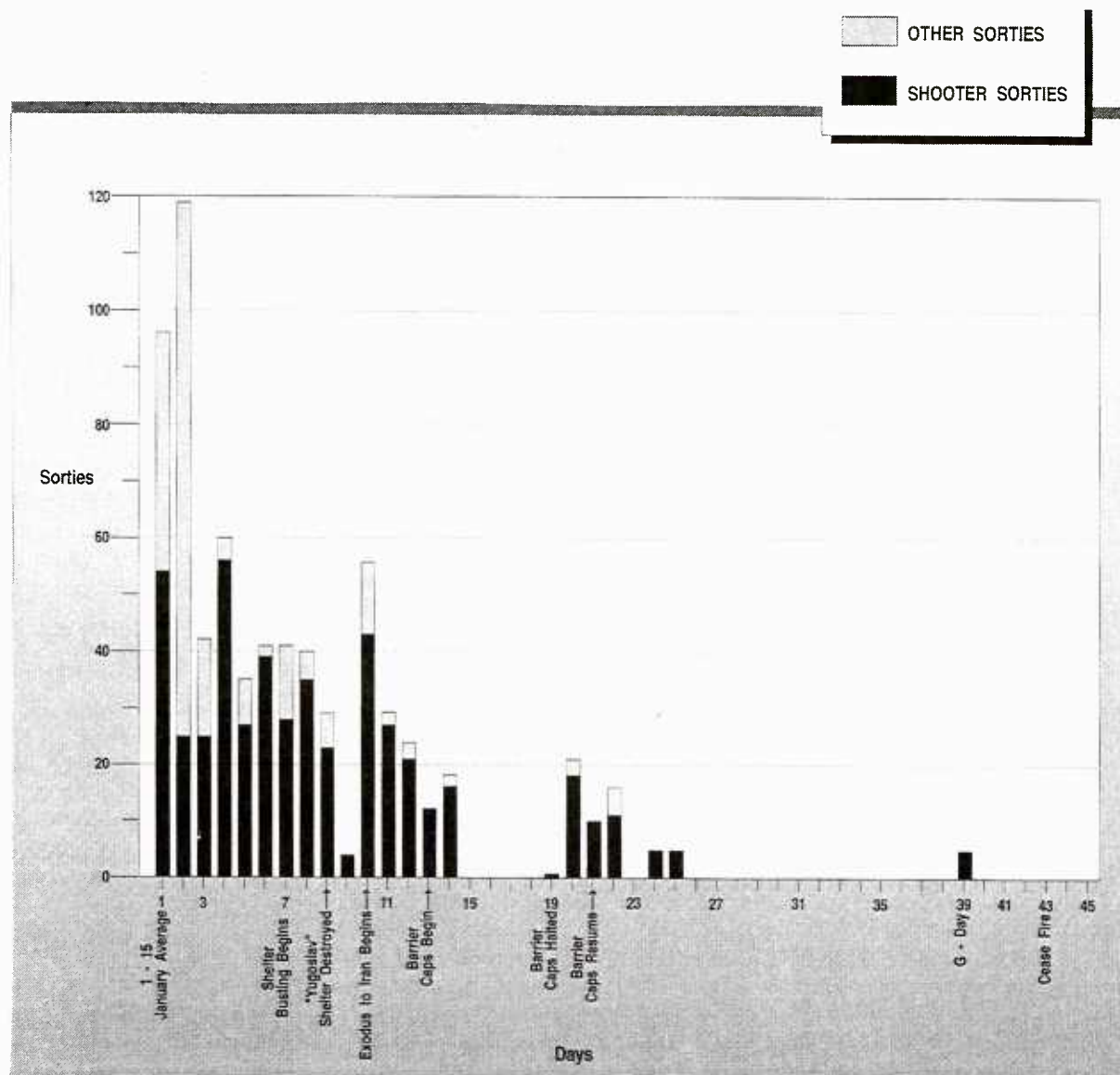
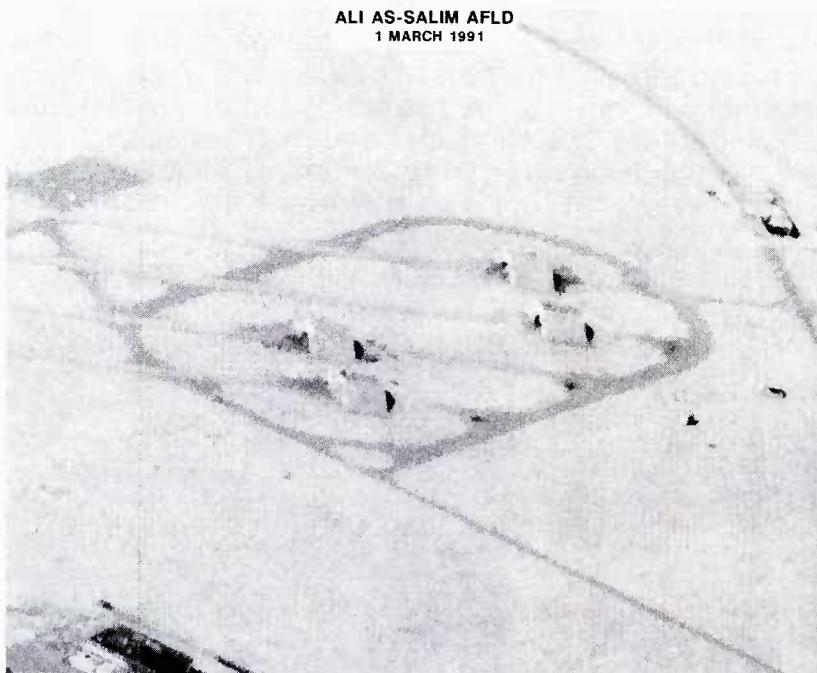


Table VI-6
Degradation of Iraqi Flight Activity

Air Forces and Airfields

The neutralization of the Iraqi Air Force occurred when Coalition air forces destroyed Iraqi aircraft in the air and on the ground. The destruction began with several air-to-air victories on the first night, and continued with the shelter-busting effort during the air campaign's second week. This effort caused the Iraqi Air Force to disperse around airfields, into civilian neighborhoods, and to fly to Iran. By the war's end, 324 of the original 750-plus Iraqi fixed-wing combat aircraft, were reported destroyed, captured, or relocated outside Iraq. According to CENTAF

ALI AS-SALIM AFLD
1 MARCH 1991



ALI AS-SALIM AFLD
1 MARCH 1991



Figure VI-20
'Ali As-Salim Airfield, Kuwait (Post-Strike). The Coalition Continued Its Pursuit of Air Superiority/Supremacy by Attacking Airfields and Their Facilities.

estimates, 109 Iraqi combat fixed-wing aircraft flew to Iran; 151 were destroyed on the ground; 33 were shot down by Coalition fighter aircraft; and 31 were captured or destroyed by ground forces (the status of others was unknown). Fewer than 300 were believed to remain in Iraq and their combat readiness was doubtful because of the disintegrated air defense C3 system, inadequate maintenance, and lack of other necessary support. Of the 594 Iraqi aircraft shelters, 375 were severely damaged or destroyed. Within six weeks, the world's sixth largest air force had been decimated.



Figure VI-21

The Tuwaythah Nuclear Research Facility, Baghdad(Post-Strike).

Nuclear, Biological, and Chemical Weapons Research and Production Facilities

A key objective was degrading the threat from Iraqi NBC weapons of mass destruction and their delivery systems (one of Iraq's centers of gravity). Air power was one of the more effective ways to reach research and production facilities deep inside Iraq. Damage to the known nuclear weapons program was substantial. The Baghdad Nuclear Research Center was damaged, including both research reactors. However, UN inspection teams and US intelligence sources subsequently discovered

Iraq's nuclear weapons program was more extensive than previously thought, and did not suffer as serious a setback as was desired.

During December, a team was formed in CONUS to determine the most effective way to attack Iraq's arsenal of CW/BW weapons. Several experiments were conducted which attempted to find a way to destroy these weapons without releasing BW agents or causing significant collateral damage. Finally, through timing of attacks and choice of munitions, planners were able to minimize the chance for toxins to spread. No chemical or biological agents were detected after the attacks and no CW/BW collateral damage was experienced.

During Operation Desert Storm, the BW program was damaged and its known key research and development facilities were destroyed. All known BW research and production capabilities were made unusable. Most of Iraq's refrigerated storage bunkers were destroyed.

Iraq's CW program was seriously damaged. At least 75 percent of Iraq's CW production capability was destroyed. At Samarra, Coalition forces destroyed or severely damaged most known primary CW production, processing, or production support buildings. All three buildings used to fill munitions at Samarra were destroyed, although the Iraqis may have moved the equipment from one building before Operation Desert Storm for safekeeping. All three precursor chemical facilities at Habbaniyah were seriously damaged. Although Iraq previously had produced and distributed many CW agents to storage sites throughout the country, the means for delivering the weapons was badly damaged. Coalition air supremacy made Iraqi Air Force delivery of these weapons unlikely; most artillery (Iraq's preferred method of delivering CW) was disabled.

Why Iraq did not use CW still is a matter of conjecture. Concerted efforts, both public and private, were made before the war to warn Saddam Hussein of severe consequences of CW use. The fact that almost no chemical munitions were distributed to Iraqi forces in the KTO suggests Saddam Hussein chose to retain tight control over this capability. UN inspections since the war have confirmed Iraq did have chemical warheads for its Scud missiles, which Iraq continued to fire until the end of the war. This suggests deterrence worked. However, Coalition attacks also disrupted the Iraqis' ability to move, load, and fire weapons, and eliminated many battlefield delivery systems. The rapid ground offensive against the already blinded and confused Iraqis made effective use of CW against the Coalition offensive almost impossible. At present, there is no conclusive answer.

Scud Production and Storage Facilities

Immediately after the war, estimates, based on imagery analysis of heavily damaged or destroyed complexes associated with Scud production, concluded Iraq's overall ability to modify or produce Scud missiles and support equipment was

severely degraded and that Baghdad's overall potential to build liquid-propellant missiles had been reduced. More recently, UN inspection teams have determined most production equipment, components, and documents had been removed before the beginning of the air campaign. Recent intelligence estimates confirm that actual damage to Scud production and storage facilities is less than previously thought.

Naval Forces and Port Facilities

Coalition air strikes and naval gunfire effectively destroyed the Iraqi Navy in the first three weeks of Operation Desert Storm. While Iraq did not have major surface combatants, it did have dangerous antiship missile capabilities that could have inflicted politically significant damage to Coalition ships, giving Iraq a needed psychological victory. Approximately 87 percent (143 of 165) of Iraqi combatant naval vessels were destroyed or damaged. By 2 February, 11 of the 13 Iraqi missile-capable boats were destroyed, and the remaining Iraqi naval forces were assessed as incapable of offensive operations. The Umm Qasr Naval Base and Khawr Az-Zubayr port facility, the primary Iraqi naval operating areas, sustained substantial damage to storage facilities. Coalition air strikes also destroyed three of Iraq's seven shore-based Silkworm antiship missile launchers and an unknown number of missiles. Because of the destruction of the Iraqi naval threat, Coalition naval forces were able to move farther north in the Persian Gulf to increase the pressure on Iraqi forces, and to support better the Offensive Ground Campaign.



Figure VI-22
Coalition Air Strikes Inflicted Serious Damage to the Umm Qasr Port Facility.



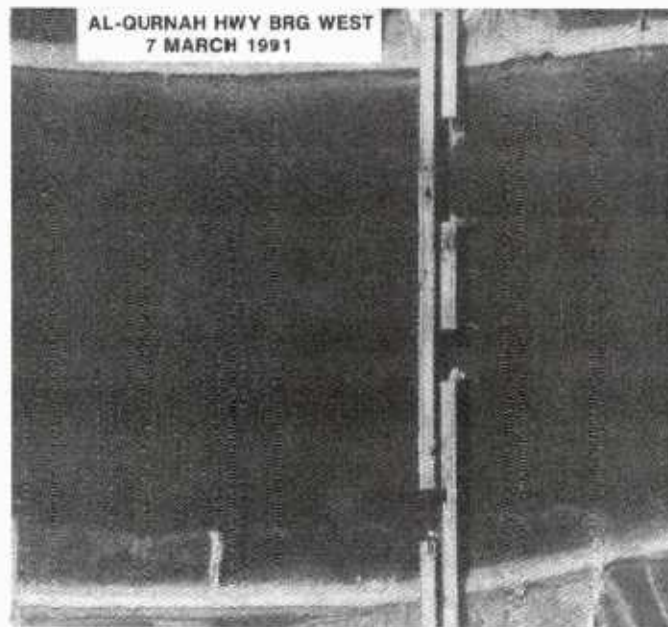
*Figure VI-23
As-Samawah Petroleum Refinery (Post-Strike).*

Oil Refining and Distribution Facilities, as Opposed to Long-term Oil Production Capability

Reducing Iraq's ability to refine and distribute finished oil products helped reduce Iraqi military forces' mobility. Aircraft carried out about 500 sorties against Iraqi oil facilities, dropping about 1,200 tons of bombs to shut down the national refining and distribution system. This offers another illustration of the effect modern PGMs and other advanced technologies have on the nature of war. For about half the bomb load dropped on one typical refinery in Germany during World War II, the Coalition effectively stopped all Iraqi refined fuels production.

The air campaign damaged approximately 80 percent of Iraq's refining capacity, and the Iraqis closed the rest of the system to prevent its destruction. This left them with about 55 days of supply at prewar consumption rates. This figure may be misleading, however, because the synergistic effect of targeting oil refining and distribution, electricity, the road, rail and bridge infrastructure, and the national C3 network, all combined to degrade amounts of oil and lubricants Iraqi commanders

received. Saddam Hussein apparently was counting on a relatively protracted conflict in which conserving Iraqi fuel supplies could be important.



*Figure VI-24
Al-Qurnah Highway Bridge West (Post-Strike). Strikes Against the Iraqi Bridge System Helped Isolate Iraqi Forces in the Kuwait Theater of Operations*

Railroads and Bridges Connecting Iraqi Military Forces with Logistical Support Centers

About three fourths of the bridges between central Iraq and the KTO were severely damaged or destroyed. Iraqi LOCs into the KTO were vulnerable because they crossed bridges over the Tigris and Euphrates rivers. The bridges were destroyed at the rate of seven to 10 a week, and the supply flow into the KTO dropped precipitously. While the supply routes into the KTO were being interdicted, Iraqi supply troops also were subjected to heavy air attacks. As bridges were destroyed, long convoys of military trucks waiting to cross were stranded and attacked. Air attacks also destroyed supplies stockpiled in the KTO and severely disrupted their distribution. In an environment where literally nothing was available locally, these efforts resulted in major shortages of food for fielded forces, particularly for those units farthest forward.



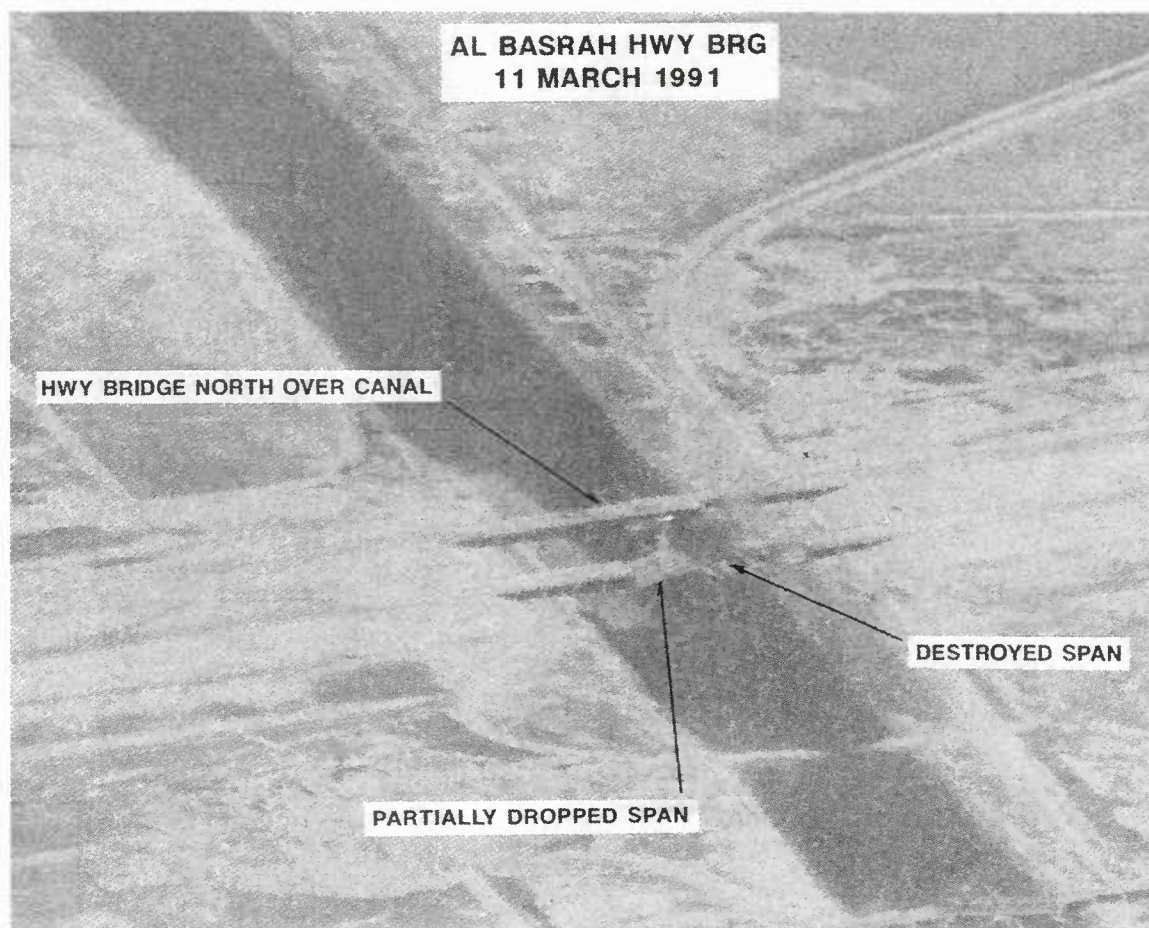
Figure VI-25

Attacks Against Bridges Cut into the Supply Effort as Evidenced by this Truck Convoy Stalled Before It had a Chance to Cross

The effort to cut the rail and road LOCs from central Iraq into the KTO further demonstrated the effect of advanced technology. During the early years of the Vietnam War, hundreds of USAF and Navy aircraft bombed the Thanh Hoa bridge in North Vietnam. It was not seriously damaged, and many aircraft were shot down. During Operation Linebacker I in 1972, the bridge was knocked down by just a few sorties using LGB and Walleye II, both PGMs. The Operation Desert Storm air campaign saw the use of improved PGMs, including LGB, Maverick, and Standoff Land-Attack Missiles (SLAM).

Video footage of Iraqi bridges falling to LGB became commonplace during briefings and on the television news. Not every PGM hit its intended target. But so many bridges were knocked down (41 major bridges and 31 pontoon bridges) and so many supply lines cut that the effect on the Iraqi forces in the KTO was severe.

In addition, the air campaign effectively interdicted LOCs within the KTO and destroyed thin-skinned tankers and other vehicles that supplied food and water. This was made possible in part by the lack of cover for moving vehicles in the desert and by US night vision capabilities that exploited this advantage even at night.



*Figure VI-26
In Past Conflicts, it Might Have Taken Numerous
Sorties to Achieve the Results Shown Here Against
the Al-Basrah Highway Bridge. Today's Technology
Usually Requires Only a Few Missions*

Iraqi Military Units, Including Republican Guards in the KTO

Iraqi forces in the KTO posed a serious threat to Saudi Arabia and the other Persian Gulf states; until they either evacuated Kuwait, were ejected, or destroyed, Kuwait could not be liberated. The air campaign worked towards all three possibilities. Saddam Hussein refused to withdraw his forces; however, the Coalition began direct air attacks to degrade the more important capabilities and assets (especially armor and artillery) and to prepare for Coalition ground forces to reoccupy Kuwait. The degree to which these objectives were accomplished was

virtually unprecedented in warfare. In less than six weeks, a combat experienced army of several hundred thousand troops, with thousands of tanks, other armored vehicles, and artillery pieces, dug into well-sited and constructed defensive positions, was severely degraded and weakened from the air. The Iraqi forces' overall combat effectiveness was reduced dramatically.

CINCCENT's Operation Desert Storm OPORD identified the Republican Guard as an Iraqi center of gravity. Primary targets included armor and artillery, because these represented a major threat to Coalition forces; logistics installations such as fuel, ammunition and supply dumps; and C3 facilities such as CPs. Not every Republican Guard division was hit equally hard; those in the path of the planned Coalition ground forces received the brunt of the attacks. Other divisions, such as those south of Al-Basrah, received less damage. The Republican Guard was not as heavily targeted as were the front-line regular Army divisions the Coalition ground forces would encounter first, for a number of reasons – they were farther from Coalition bases and better equipped than front-line forces, which required longer flights with more airborne support, and risked higher aircraft attrition. More importantly, CINCCENT directed that comparatively greater damage be inflicted on the front-line forces to reduce Coalition ground forces' casualties.

Military Production and Storage

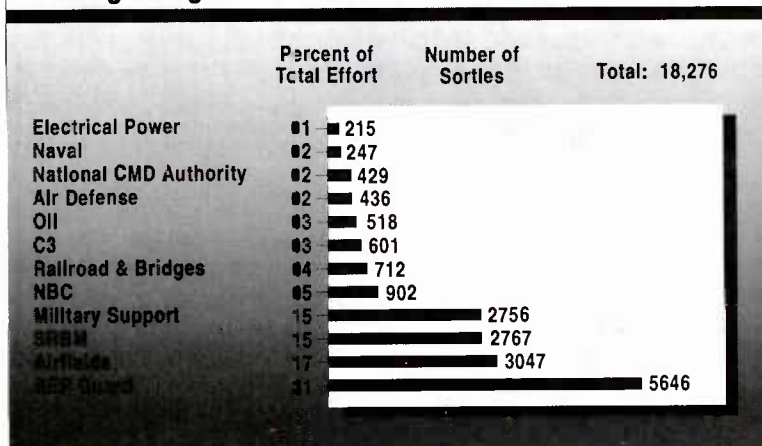
Military production and storage areas made up 15 percent of the total Strategic Air Campaign targets, attacked by about 2,750 sorties. By the end of the war, military production facilities had been severely damaged. At least 30 percent of Iraq's conventional weapons production capability, which made small arms, artillery, small- and large-caliber ammunition, electronic and optical systems, and repaired armored vehicles, was damaged or destroyed.

Supply depots were so numerous and large that they could not be eliminated; however, they were methodically attacked throughout the war, resulting in moderate reduction in stored materials. As an example, the massive military supply complex at At-Taji occupied more than 10 square miles. Thousands of targets were within its confines, and it was struck repeatedly. On 29 January, as another example, B-52s hit the ammunition storage facility at Ar-Rumaylah, touching off a tremendous explosion – the equivalent of an erupting volcano.

EPW Assessments

One benefit of the rapid Coalition ground advance was the capture or surrender of many Iraqi senior officers and thousands of Iraqi troops. The officers provided Coalition intelligence debriefers with a unique perspective.

Strategic Targets Level of Effort



*Table VI-7
Strategic Air Campaign Level of Effort*

According to sources from four different Iraqi Army and Republican Guard armor, infantry, and antiaircraft units, for example, the air campaign's effect was telling. According to selected EPW reports, in some divisions, up to half the personnel who had deployed to the KTO deserted because of shortages of food and water, hardships caused by the bombing, or fear of being killed or wounded. Selected senior officer EPW also described very high (roughly 77 percent) attrition rates for tanks or wheeled vehicles in particular units. Not all units suffered attrition rates as high as this. For example, senior EPWs from other Iraqi units, such as the 50th Armored Brigade, 12th Armored Division, and the 8th Mechanized Brigade, 3rd Armored Division, reported lower attrition rates.

An indirect impact of Coalition air supremacy was reflected in the Iraqis' ignorance of Coalition dispositions and operations. This was important in preparing for and executing the ground campaign's left hook. In addition, although some units did relocate, one senior officer said that, after the start of Operation Desert Storm, he could no longer safely move his forces because of the threat of air attack. The Iraqis' problems were compounded by the inability to train their forces and maintain their equipment. The air interdiction effort and degradation of the supply system stressed the Iraqi forces to and, in some cases, beyond the breaking point. Experienced armor officers were visibly shaken when they described helplessly watching the progressive destruction of their forces from the air.

The EPWs agreed almost unanimously that PSYOP at the battlefield level had a substantial effect on front line forces' morale. Air strikes made it impossible for Iraqi commanders to stop the flow of soldiers deserting from some units.

Safwan Revelations

On 3 March, CINCCENT met with Iraqi senior military officers, including the III Corps commander, to finalize cease-fire terms. After the Iraqis informed CINCCENT about the status of Coalition Prisoners of War (POW) in Iraqi hands, the Iraqis asked for an accounting of the Iraqi EPWs the Coalition held. When CINCCENT replied the counting was still going on, but the number exceeded 58,000, the Iraqi vice chief of staff, according to eyewitness accounts, appeared stunned. When he asked the III Corps commander if this were possible, he replied that it was possible, but he did not know. The discussion then turned to establishing a no-contact line to separate Coalition and Iraqi forces. When CINCCENT presented his proposed line, the Iraqi vice chief of staff asked why it was drawn behind the Iraqi troops. CINCCENT said this was the forward line of the Coalition advance. The Iraqi officer, again looking stunned, turned to the III Corps commander, who again replied that it was possible, but he did not know. Thus, three days after hostilities ended, the Iraqi senior military leadership did not know how many men they had lost or where the Coalition forces were. While their ignorance may in part reflect the weaknesses of a totalitarian system in which bad news travels slowly, it undoubtedly also reflects the crippling of Iraqi intelligence and communications by the air campaign, the effectiveness of the deception actions at all levels, and the sweep, speed, and boldness of the ground campaign.

OPERATIONAL CONSIDERATIONS

Air Superiority and Air Supremacy

Throughout Operation Desert Shield, Coalition air forces were flying defensive counter air sorties to ensure the arrival and movement of forces into the AOR remained unimpeded by hostile attack. These missions typically lasted several hours, with fighters patrolling the border and refueling periodically to maintain an around the clock umbrella over Coalition forces.

Once Operation Desert Storm began, defensive counter air patrols continued; while additional offensive counter air fighter sweeps and strike package escorts into Iraq sought out and engaged Iraqi Air Force opposition. Assisted by AWACS and E-2Cs, these fighters achieved and maintained air superiority throughout the Persian Gulf War. Table VI-8 depicts air-to-air victories officially credited to Coalition air forces.

The air campaign's pre-eminent initial objective was the fragmentation and virtual destruction of the Iraqi IADS, which was paralyzed in Operation Desert Storm's early hours. It is difficult, if not virtually impossible, for a modern, mechanized army to operate effectively once control of the sky above it is lost.

<u>Date</u>	<u>Unit</u>	<u>Shooter Aircraft</u>	<u>Type Downed</u>	<u>Weapon Used</u>
17 Jan 91	33 TFW	F-15C	MIG-29	AIM 7
17 Jan 91	1 TFW	F-15C	F-1 Mirage	AIM 7
17 Jan 91	33 TFW	F-15C	2/F-1 Mirage	AIM 7 (Both)
17 Jan 91	33 TFW	F-15C	MIG-29	AIM 7
17 Jan 91	33 TFW	F-15C	MIG-29	AIM 7
17 Jan 91	VFA-81	F/A-18	MIG-21	AIM 9
17 Jan 91	VFA-81	F/A-18	MIG-21	AIM 7
19 Jan 91	33 TFW	F-15C	MIG-25	AIM 7
19 Jan 91	33 TFW	F-15C	MIG-25	AIM 7
19 Jan 91	33 TFW	F-15C	MIG-29	AIM 7
19 Jan 91	33 TFW	F-15C	MIG-29	AIM 7
19 Jan 91	33 TFW	F-15C	F-1 Mirage	AIM 7
19 Jan 91	33 TFW	F-15C	F-1 Mirage	AIM 7
24 Jan 91	RSAF	F-15C	2/F-1 Mirage	AIM 9 (Both)
26 Jan 91	33 TFW	F-15C	MIG-23	AIM 7
26 Jan 91	33 TFW	F-15C	MIG-23	AIM 7
26 Jan 91	33 TFW	F-15C	MIG-23	AIM 7
27 Jan 91	36 TFW	F-15C	2/MIG-23	AIM 9 (Both)
27 Jan 91	36 TFW	F-15C	MIG-23	AIM 7
27 Jan 91	36 TFW	F-15C	F-1 Mirage	AIM 7
28 Jan 91	32 TFG	F-15C	MIG-23	AIM 7
29 Jan 91	33 TFW	F-15C	MIG-23	AIM 7
2 Feb 91	36 TFW	F-15C	IL-76	AIM 7
6 Feb 91	36 TFW	F-15C	2/SU-25	AIM 9 (Both)
6 Feb 91	36 TFW	F-15C	2/MIG-21	AIM 9 (Both)
6 Feb 91	926 TFG	A-10	Helo	Gun
6 Feb 91	VF-1	F-14A	Helo	AIM 9
7 Feb 91	33 TFW	F-15C	2/SU-7/17	AIM 7 (Both)
7 Feb 91	33 TFW	F-15C	SU-7/17	AIM 7
7 Feb 91	36 TFW	F-15C	Helo	AIM 7
11 Feb 91	36 TFW	F-15C	Helo	AIM 7
15 Feb 91	10 TFW	A-10	MI-8 Helo	Gun

Table VI-8

Operation Desert Storm Air-to-Air Victories by Coalition Air Forces, 17 January to 28 February. Source: Joint Staff/J3 (Joint Operations Division).

American ground forces have not had to fight without air superiority since World War II; the last time an American soldier was killed by enemy aircraft attack was during the Korean War. Dominance of the airspace is not, however, an end in itself, but something to allow other forces to operate more effectively. Air supremacy allowed Coalition land, sea and air forces to maneuver, deploy, resupply, stockpile and fight as they desired – a luxury the enemy did not have.

In future conflicts against a sophisticated military, the battle for air supremacy will be a key determinant. The fate of the Iraqi military machine will be remembered for decades. The Soviet Air Force Chief of Staff, General A. Malyukov, remarked after the war: "The war in the Persian Gulf provided a textbook example of what air supremacy means both for the country that gained it, and for the country ceding it."

Suppression of Enemy Air Defenses

Coalition aircraft conducting air defense suppression missions saturated Iraqi airspace with jammers, shooters, and bombers. Iraqi defenses that attempted to engage were disrupted, and risked being destroyed.

EF-111As and EA-6Bs were used in stand-off and close-in orbits to jam early warning, acquisition, and GCI radars. EC-130H *Compass Call* aircraft jammed radio communications, data links, and navigation systems. F-4Gs, F-16s, EA-6Bs, A-6Es, A-7Es, and F/A-18s used HARMs to destroy acquisition, GCI, and target tracking radars. Various aircraft dropped bombs on air defense emplacements and control facilities. SEAD forces and bomb droppers caused confusion, hesitation, and loss of capability, which degraded Iraqi air defense capability.

Navy, Marine, and USAF aircraft used HARMs during Operations Desert Storm. USAF F-4Gs used most of the HARMs. For Navy and USMC HARM-shooters, initial tactics were based on the pre-emptive use of HARMs and Electronic Countermeasures (ECM). Typically, the use of HARMs in the preemptive mode was more common when supporting attacks on heavily defended strategic targets inside Iraq. The target-of-opportunity mode was more frequently used during operations against less well-defended targets and fielded forces in the KTO. More than half of all HARMs used were expended during the first week of the war, with another third expended from 6 to 13 February when the emphasis on attacking Iraqi forces in the KTO increased. Both of these periods also saw a significant concentration of strike efforts on heavily defended strategic targets. By the end of the conflict, reactive HARMs and ECM became common as a result of combat experience and the perceived need to husband HARMs.

Because of the extensive air defense threat, coordination among the Services to provide mutual support was essential to Operation Desert Storm's success. The JFACC tasked apportioned SEAD sorties, guaranteeing a coordinated, effective, and

Dedicated Coalition Electronic Warfare Aircraft in Theater on 20 January

<u>Location</u>	<u>Unit/Service</u>	<u>No. of aircraft</u>	<u>Type of aircraft</u>
Shaikh Isa, Bahrain	USMC	12	EA-6B
Shaikh Isa, Bahrain	USAF	48	F-4G
At-Taif, Saudi Arabia	USAF	18	EF-111A
King Fahd, Saudi Arabia	USAF	2	EC-130H
Riyadh, Saudi Arabia	USAF	7	EC-130H
Bateen, UAE	USAF	6	EC-130H
<i>USS Midway, USS Ranger, USS America, US Roosevelt, USS Kennedy, USS Saratoga</i>	USN	27	EA-6B
Jiddah, Saudi Arabia	USN	2	EA-3B
Bahrain Intl, Bahrain	USN	2	EP-3E
Masirah, Oman	USN	1	EP-3E
Bahrain Intl, Bahrain	USN	1	P-3B (RP)
JTF Proven Force (Incirlik, Turkey)	USAF	6	EF-111A
	USAF	3	EC-130H
	USAF	12	F-4G
	USAF	13	F-16C
Total		160	

NOTE: Some of these aircraft (e.g., F-4Gs and F-16Cs) eventually were used for missions other than suppression of enemy air defenses.

prioritized SEAD effort. Almost all Coalition aircraft contributed. In their first combat use, ATACMS demonstrated a rapid response capability. A Multiple Launch Rocket System launcher, armed with ATACMS, received a fire mission while moving in convoy, occupied a hasty firing position, computed firing data and launched a missile that neutralized an SA-2 site. On 20 February, an Army attack helicopter battalion conducted a deep strike in the Iraqi 45th Infantry Division rear area – EF-111As, F-4Gs, and EC-130Hs provided SEAD support on the way in, which helped the helicopters safely complete the mission.

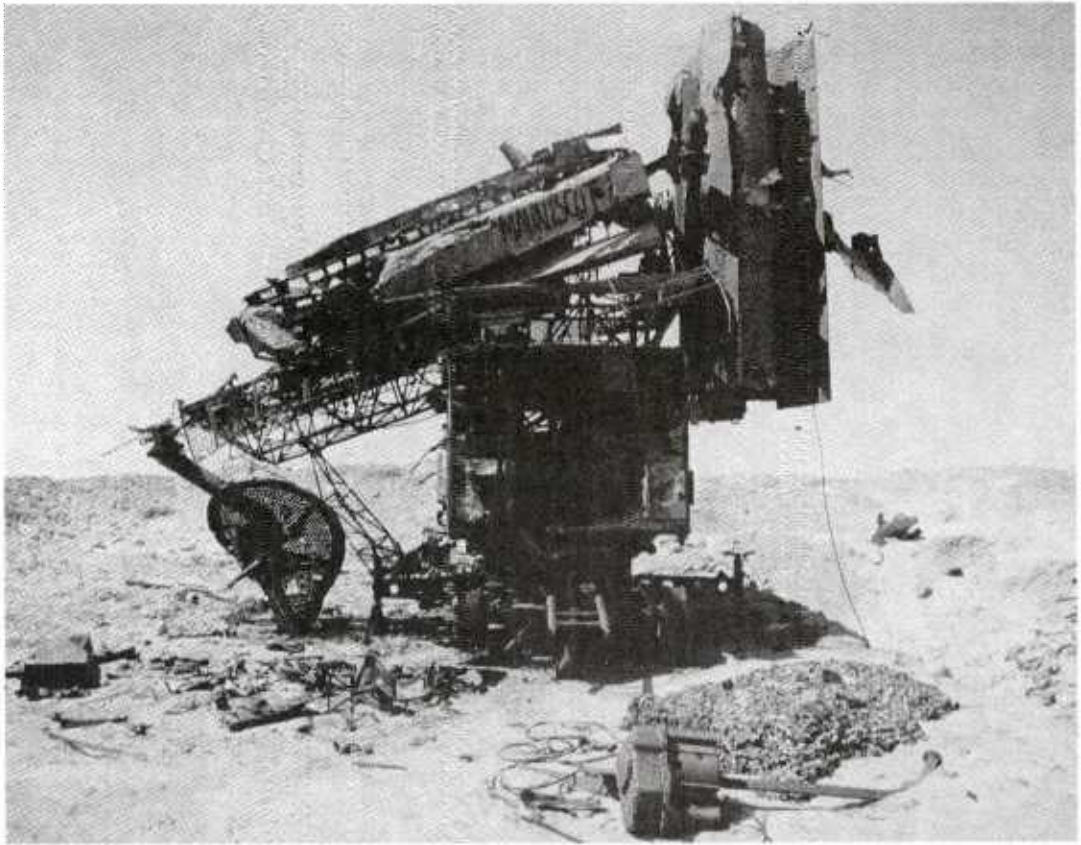
SEAD tactics changed during the conflict, especially in the KTO. By using the APR-47 electromagnetic sensor system to see and attack threats as they came on the air, the F-4Gs conserved HARMs when threat activity diminished. The F-4Gs then were more available to support attack flights as they serviced kill boxes. For example, F-4Gs located and attacked mobile SA-6s deployed with the Republican Guards.



Figure VI-27
A Destroyed Surface-to-Air Missile Launcher



Figure VI-28
Antiaircraft Artillery Pieces at an Iraqi Airfield Succumbed to the Coalition Air Onslaught



*Figure VI-29
A Destroyed Fan Song Radar, Once Part of the Iraqi Air Defense System*

The attacks on the Iraqi electronic order of battle (EOB) affected every aspect of air supremacy operation. Using Tactical Electronic Reconnaissance Processing and Evaluation System, USMC EA-6Bs provided near-real-time (NRT) updates to the threat EOB.

The EC-130Hs also made major contributions, flying from both Bateen, United Arab Emirates (UAE), and Incirlik, Turkey. Jamming enemy radio communications, data links, and enemy navigation systems, EC-130Hs disrupted air-to-air and air-to-ground Iraqi C3 networks.

EF-111As flew from At-Taif, and from Incirlik. They were part of the initial surge of aircraft across the Iraqi border the first night of the war, and established orbits to escort strike packages into the H-3 and Baghdad areas. They jammed EW, height finder, GCI, and target-acquisition radars, and were effective in tricking the enemy into opening fire at false radar returns in areas where there were no Coalition aircraft.

The F-4G and the F-16 (in the SEAD role) flew from Shaikh Isa and from Incirlik, firing 1,061 HARMs. F-4Gs were among the first aircraft to cross the Iraqi border to

protect strike flights in the Baghdad and H-2/H-3 areas. During the latter stages of the war, with the remaining Iraqi radars rarely emitting, F-4G aircrews used AGM-65D Maverick missiles against non-emitting radar targets.

Electronics intelligence data for the period 16 January to 10 February shows a high level of EOB activity initially, with a dramatic decrease 48 to 72 hours into the war. SAM operators frequently fired with limited or no radar guidance, reducing their overall effectiveness. This much reduced level continued for the remainder of the war.

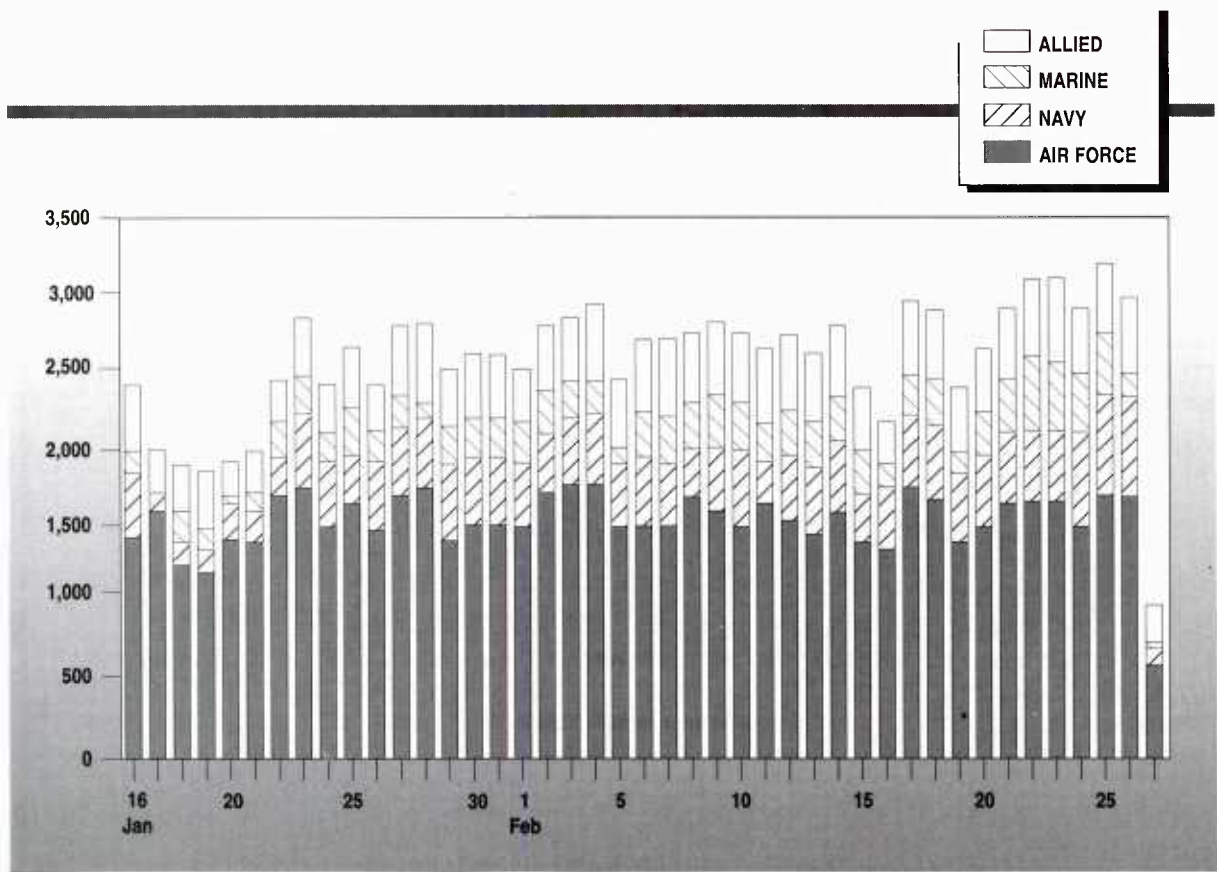


Table VI-9
Number of Coalition Fixed-Wing Aircraft Sorties

Aircraft Sorties

The 43-day air campaign against Iraq and Iraqi forces in Kuwait involved more than 2,780 US fixed-wing aircraft, which flew more than 112,000 individual sorties. To support this enormous undertaking, the USAF committed more than 1,300 aircraft (about half of the Coalition total), the USMC about 240 aircraft (about nine

percent of the total), and Coalition partners more than 600 aircraft (about 25 percent of the total). The Navy deployed six aircraft carriers to the theater, with more than 400 aircraft, or about 16 percent of the Coalition total. (For more details on specific weapons systems, see Appendix T.)

Technological Revolution

Technological breakthroughs revolutionized air warfare. Because of its precision delivery capability and low-observable, or stealth technology, planners assigned F-117As to attack the most heavily defended, high-value, and hardened targets. Forty-two F-117As flew approximately two percent of Coalition fixed-wing attack sorties, and struck about 40 percent of the strategic targets. This advanced technological capability allowed aircrews to strike more targets using fewer aircraft.

The development and improvement of PGMs that use IR, electro-optical (EO), electromagnetic radiation, or laser guidance, improved the effectiveness and efficiency of air attacks. These technological breakthroughs, with improvements in such areas as electronic warfare and C3I, combined to provide the Coalition an overwhelming air warfare capability.

Tomahawk Land Attack Missile

Unmanned TLAMs attacked high value targets day and night, helping deprive the Iraqi leadership of respite from attack, especially early in the air campaign. TLAMs were launched by surface warships and submarines at targets 450 to 700 miles away.

Two types of TLAM were used during Operation Desert Storm: The conventional missile with a unitary warhead (TLAM-C); and, a variant equipped with submunitions (TLAM-D). The TLAM-C delivered single, 1,000-lb warheads. The TLAM-D dispensed up to 166 armor-piercing, fragmentation, or incendiary bomblets in 24 packages.

By the war's end, the Navy had fired 288 TLAMs from 16 surface ships and two submarines – an important part of the air campaign. TLAM missions required no airborne aircraft support.

GBU-28

The GBU-28, a 4,700-lb deep-penetrator LGB, was not even in the early stages of research when Kuwait was invaded. The USAF did not ask industry for ideas until the week after combat operations started. Its rapid development and combat delivery were impressive.

The bomb was fabricated starting on 1 February, using surplus 8-inch artillery tubes. The official go-ahead for the project was issued on 14 February, and explosives for the initial units were hand-loaded by laboratory personnel into a bomb body that was partially buried upright in the ground outside the laboratory in New York.

The first two units were delivered to the USAF on 16 and 17 February, and the first flight to test the guidance software and fin configuration was conducted on 20 February. These tests were successful and the program proceeded, with a contract let on 22 February. A sled test on 26 February proved that the bomb could penetrate over 20 feet of concrete, while an earlier flight test had demonstrated the bomb's ability to penetrate more than 100 feet of earth. The first two operational bombs were delivered to the theater on 27 February – and were used in combat just before the cease-fire.

The Counter-Scud Effort

Long before the offensive, it was recognized that Saddam Hussein was likely to attack Israel with Scuds in the event of hostilities. Accordingly, considerable thought was given to how Israel could be protected from such attacks without Israel's own forces entering the war. Although there was never any doubt about the willingness of Israel's highly capable forces to take on this mission, the President realized this was precisely what Saddam Hussein hoped to achieve. At a minimum, this almost certainly would have led to a war between Israel and Jordan and allowed Saddam Hussein to change the complexion of the war from the liberation of Kuwait to another Arab-Israeli conflict. It might easily have brought down the government of Jordan and replaced it with a radical one. The Coalition's unity would be tested severely, with potentially major repercussions.

Accordingly, the President directed that unprecedented steps be taken to persuade Israel not to exercise its unquestioned right to respond to Iraqi attacks. A special, secure communications link established between the Department of Defense (DOD) and the Israeli Ministry of Defense (MOD) before the offensive began enabled immediate and frequent contact between senior US and Israeli officials. Early warning of Iraqi Scud missile attacks on this link gave the Israeli populace as much as five minutes to take shelter before missile impact. The President offered and Israel agreed to accept four US Patriot batteries manned with US troops which deployed

from Europe in record time. Delivery of Israeli-manned Patriot batteries was accelerated.

One air campaign target was Iraq's strategic offensive capability, including Scud production, assembly and storage, and launch sites. The first counter-Scud missions were flown on D-Day against fixed launch complexes and Scud support depots. By the third day of air operations, attacks had begun on ballistic missile production and storage capability.

On the second day of Operation Desert Storm, Iraqi Scud missiles struck Tel Aviv and Haifa, Israel. Seven people were slightly injured by broken glass, but the political and emotional impact was tremendous. There was concern Saddam Hussein might use CW against Israel. In fact, 11 trucks were observed departing the Samarra CW storage facility in Iraq, heightening speculation about Iraqi CW preparations. Concern intensified that if the Scud threat were left unchecked, Israel might be forced to strike back.

When Iraq launched another Scud attack on Tel Aviv on 19 January, the pressure to respond was intense. A target intelligence officer assigned to the Black Hole identified what he believed to be a Scud launch site and recommended that F-15Es, loaded with CBU-89s and CBU-87s, strike the location. After this strike by the 4th TFW, which reported secondary explosions, there was a break of 85 hours before the Iraqis launched a single Scud against Israel, and more than five days before another mass launch.

The fourth day saw increased effort to locate, disrupt operations, and destroy mobile Scud missiles. Many sorties were diverted or replanned from their intended targets to hunt for and suppress the Scuds. Although the strategic target list included Scud missile capabilities only as one of several higher priority target sets, Scud suppression missions quickly took up an increasing share of air operations. Despite the poor weather conditions that caused the cancellation of nearly 300 sorties on 20 January, the JFACC kept planes on both air and ground alert for rapid response to Scud launches.

The Scud crews had several initial advantages. They fired from pre-surveyed launch positions. Mobile erector launchers are only about as large as a medium-sized truck and moved constantly. This enabled crews to set up relatively quickly, fire, and move before Coalition forces could respond. The area of western Iraq from which the missiles that struck Israel were launched is rugged, a good setting in which to conceal mobile launchers in ravines, beneath highway underpasses, or in culverts.

Scud launchers could be reconfigured and moving within a few minutes after a launch. Within 10 minutes after launch, a mobile Scud launcher could be anywhere within five miles of the launch site. If the Iraqi Scud crew were given five more minutes, it could be anywhere within nine miles of the launch point – 12 miles if it traveled on a road. Destruction of mobile Scud launchers depended on time – the faster strike aircraft could get to the target the better the chance of destroying

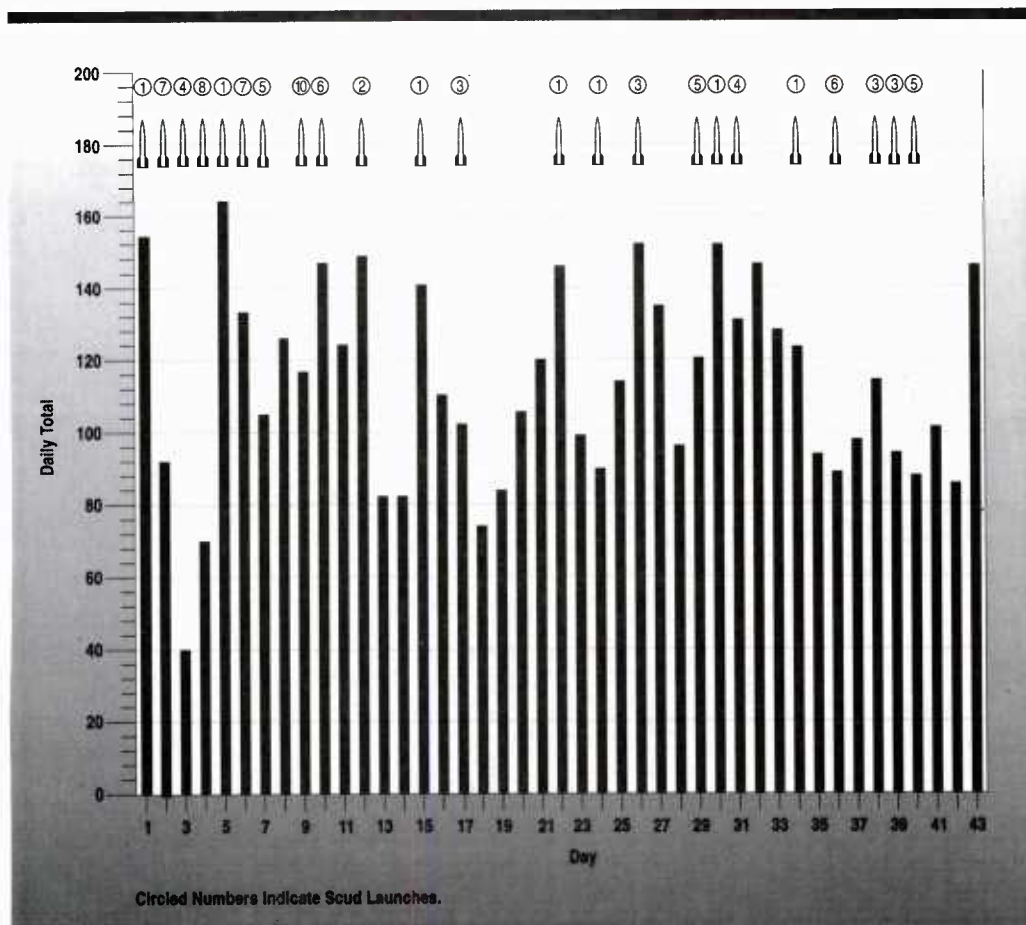


Table VI-10
*Dedicated ATO-Planned Counter-Scud Aircraft Sorties, and
 Estimated, Actual Scuds Launched.*

the launcher. (See Appendix K and Appendix T for additional discussion of Scud launch detection.)

A considerable segment of the available intelligence-gathering capability was shifted to counter-Scud operations, including reconnaissance aircraft (U-2/TR-1s and RF-4Cs). Intelligence originally had estimated Iraq had 36 mobile Scud launchers, 33 of which were believed operational. *Ad hoc* groups were formed to develop options to the seemingly intractable problem of how to find and destroy Scuds. A special planning cell was set up in the US Embassy in Tel Aviv, headed by a Joint Staff flag officer, to give the Israelis a chance to analyze the available intelligence, and elicit their ideas. When one Scud hit a residential section in Tel Aviv on 22 January, killing three Israelis and injuring dozens more, the problem took on even greater urgency.

The next week saw an intense effort in western Iraq to eliminate the mobile Scud launchers. B-52s bombed suspected Scud hide sites and support facilities at H-2 and H-3 airfields in western Iraq during the day and at night. During the day, A-10s and F-16s patrolled the area; at night, LANTIRN-equipped F-16s and F-15Es, and FLIR-equipped A-6Es took up the task. Pilots often received target coordinates or patrol areas, based on the most up-to-date information, as they headed out to the planes. Using Defense Support Program (DSP) early warning information and other indications, CENTCOM directed aircraft to attack the launchers. JSTARS helped detect and report destruction of several possible mobile launchers north of the KTO on D + 5. By D + 10, the weather had cleared and A-10s joined in what came to be called the Great Scud Hunt.

The Scud-hunting effort in southeast Iraq was similar to that in the west. The search area was nearly as large, and the mobile Scud launchers were difficult to find. However, Coalition tactics made it dangerous for Scud transporters, and any other vehicles, to move; JSTARS and other surveillance assets alerted ground- and airborne-alert aircraft to vehicular movement, resulting in rapid attack in many cases. Following Scud launches, attack aircraft were concentrated in the launch area to search for and attack suspect vehicles.

By early February, the counter-Scud effort seemed to be having an effect, although no destruction of mobile launchers had been confirmed. The daily CENTCOM chronology for this period contains numerous entries such as, "one Scud launched towards Israel, no damage," and "Patriots destroyed the only Scud launched at Saudi Arabia." As more intelligence assets were brought to bear on the problem, specific Scud operating areas (Scud boxes) were more clearly defined; Coalition striking power was concentrated there. On 19 February, Coalition aircraft began dropping CBU-89 area denial mines into suspected operating areas, to hamper the launchers' mobility. A key element in this effort was small SOF groups on the ground who provided vital information about the Scuds.

On 25 February, a Scud struck a barracks in Dhahran, Saudi Arabia, killing 28 US soldiers and wounding almost 100 more. When the war ended, intelligence analysis showed the Iraqis had fired 88 modified Scuds, 42 towards Israel and 46 at Saudi Arabia and other Persian Gulf states.

Patriot Defender Missile Defense System

Scud ballistic missiles were the main weapon system with which Saddam Hussein took significant offensive action against Coalition forces, and the only one to offer him a possible opportunity, through the attacks on Israel, to achieve a strategic objective. Had they been more accurate or able to penetrate more successfully, they might have inflicted serious damage on military targets, including the large troop concentrations at Saudi ports at the start of the war. The Army's Patriot Defender missile defense system not only helped defeat the psychological



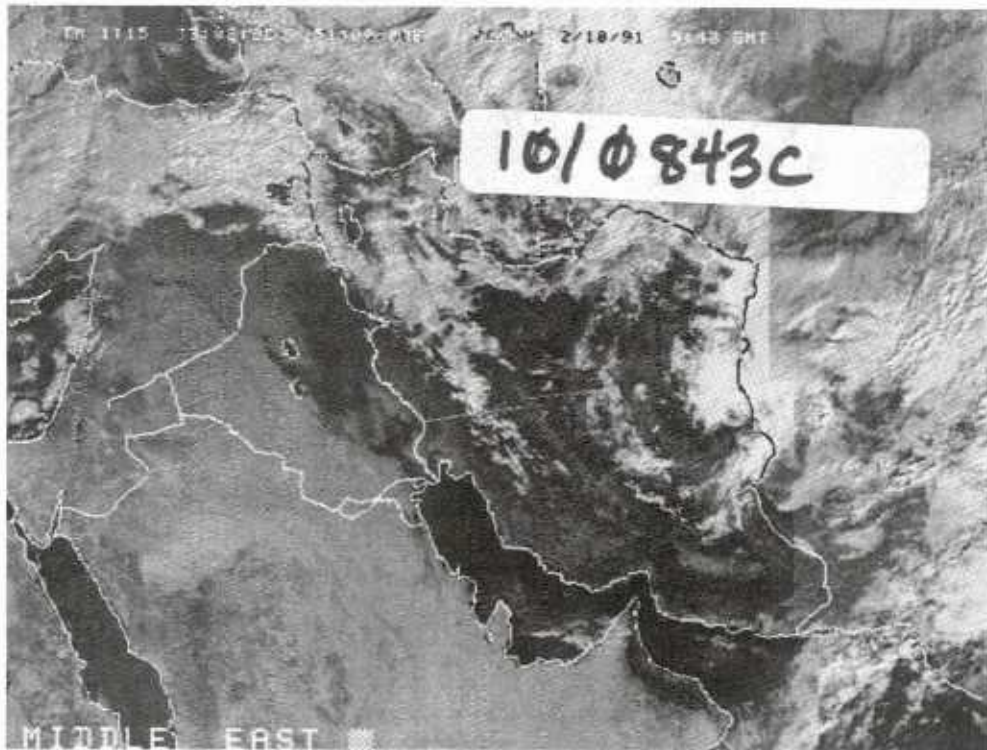
Figure VI-30

Of All the Scuds Fired by Iraq, Only One Proved Fatal to US Personnel. Twenty-eight US Soldiers Were Killed When a Scud Hit Their Barracks.

threat of Iraq's Scuds, instilling a feeling of confidence in people in the targeted areas, but also almost certainly reduced civilian casualties. Scud attacks resulted in substantial property damage, including that caused by falling debris from the Patriots themselves. (For additional discussion of Patriot, see Appendix T.)

Weather

The worst weather in at least 14 years (the time the USAF has kept records of Iraqi weather patterns) was a factor during all phases of the war. Although no TLAM attack was canceled by poor weather, approximately 15 percent of scheduled aircraft attack sorties during the first 10 days were canceled because of poor visibility or low overcast sky conditions. Cloud ceilings of 5,000 to 7,000 feet were common, especially during the ground campaign's last few days. These conditions also had a negative effect on the ability to collect imagery and hindered the BDA process.



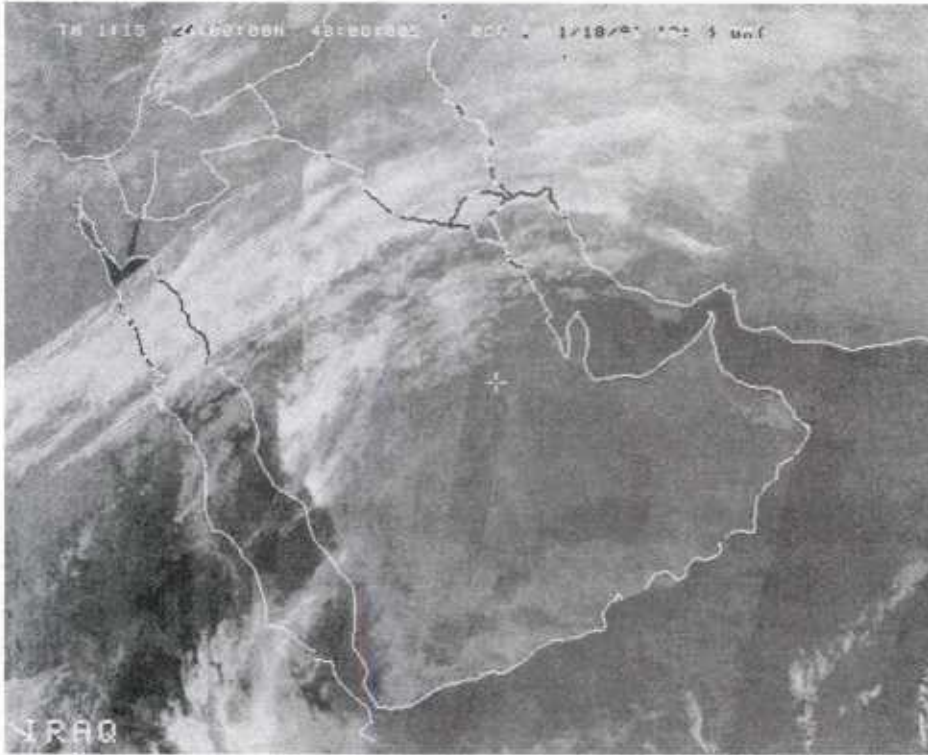
*Figure VI-31
Satellite Weather Imagery Showing a Clear Day On 10 February*

Before the air campaign began, forecasters warned the Baghdad region's weather would deteriorate the evening of 18 January as a frontal system moved into Iraq. A morning F-16 mission scheduled to strike the At-Taji Rocket Production Facility north of Baghdad, for example, was diverted to an alternate target, the Ar-Rumaylah airfield, because of a solid undercast. However, mission results could not be assessed for several days because of cloud cover.

Weather and cloud cover also affected the delivery of LGB. Clouds could interfere with the laser beam used to illuminate targets, causing the LGB to lose guidance. Since JFACC directives required aircrews to avoid collateral damage, some aircraft returned to base with their weapons.

The Defense Meteorological Satellite Program (DMSP) helped the JFACC plan the most effective use of systems whose performance was affected by high humidity, fog, rain, and low clouds. DMSP was so important the JFACC kept a light table next to his desk to review the latest DMSP data, and the TACC waited for the latest DMSP images before finalizing the daily ATO.

An example on 24 January illustrates DMSP's value. Two DMSP images, only an hour and 40 minutes apart, showed cloudy skies over Baghdad clearing while sunny skies in Al-Basrah gave way to cloud cover. This type of timely, cloud cover



*Figure VI-32
Satellite Photo Shows Clouds Covering the Area on 18 January*

assessment allowed the JFACC to make adjustments in the MAP, and Coalition aircrews to make tactical adjustments, in order to put more bombs on target.

Air Refueling

Aerial refueling was crucial throughout the crisis; the thousands of airlift missions to the Gulf, and the hundreds of combat aircraft deployments, could not have been accomplished without the KC-135s and KC-10s of the Strategic Air Command (SAC) tanker force.

Likewise, the air campaign could not have been conducted without the efforts of USAF KC-135s and KC-10s, USMC KC-130s, Navy KA-6s and tanker-configured S-3s, Saudi KE-3s, French KC-135s, and RAF Tristars and VC-10s. The single largest source of aerial refueling support came from SAC's tanker fleet; by the end of the war, SAC had committed 46 KC-10s and 262 KC-135s to Operation Desert Storm. Most combat sorties Coalition aircraft flew required one or more aerial refuelings. Navy, USMC, and other Coalition tankers flew more than 4,000 sorties, while USAF tankers flew



*Figure VI-33
A KC-10 Tanker Passes Fuel to an F-15*

more than 15,000. Approximately 16 percent of USAF tanker missions supported Navy or USMC aircraft.

The mission's importance cannot be described by merely reciting the numbers of sorties, aircraft refueled, or gallons of fuel dispensed. The strike packages that hit Iraq on the first night of the war were able to reach their targets only because of repeated aerial refuelings going to and returning from their targets. The fighters that patrolled Iraqi airspace and kept the Iraqi Air Force on the ground needed several refuelings. By themselves, most attack aircraft are limited to a few hours' flight; with aerial refueling, their range and endurance is limited only by crew stamina. Missions by bombers and attack aircraft, AWACS, reconnaissance, EW, and special operations aircraft were either made possible or improved by aerial refueling.

Scheduling and coordinating refueling support for attack aircraft were major tasks. At JFACC headquarters, coordinating refueling was a separate event that took place after MAP strike sortie planning was completed. AWACS and E-2s played a key role in air refueling, but it was a major challenge. Initially, the air refueling plan was to have the tankers and receivers operate almost independently, with AWACS providing limited assistance, on request. However, this became unwieldy because of the large numbers of tankers and receivers. Eventually, an AWACS weapons director was assigned full time responsibility for tanker control. Also, the complexity of the

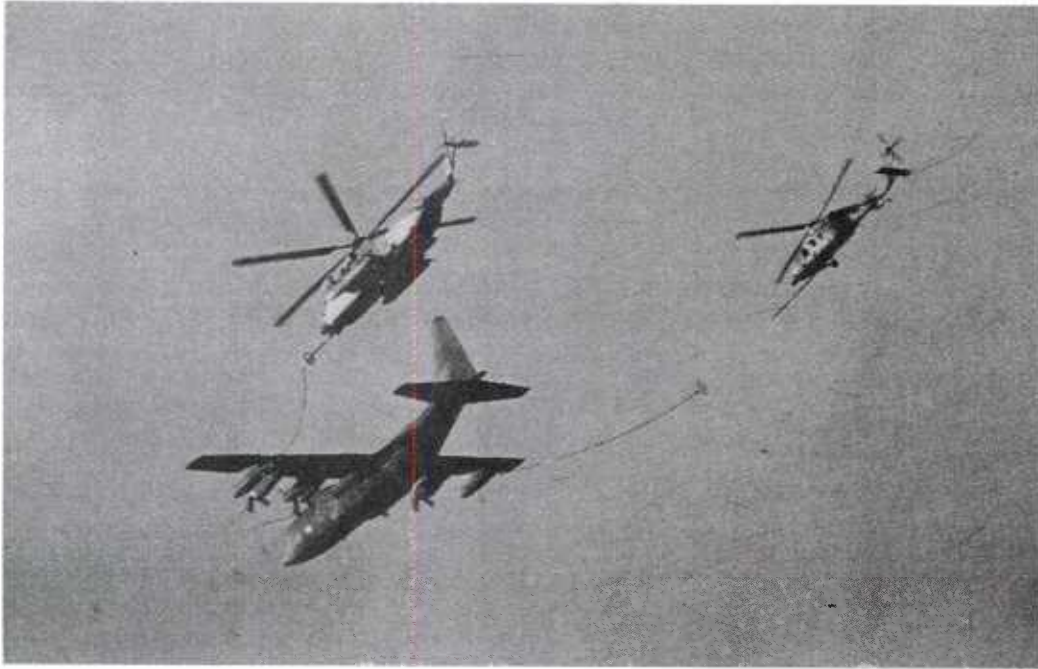


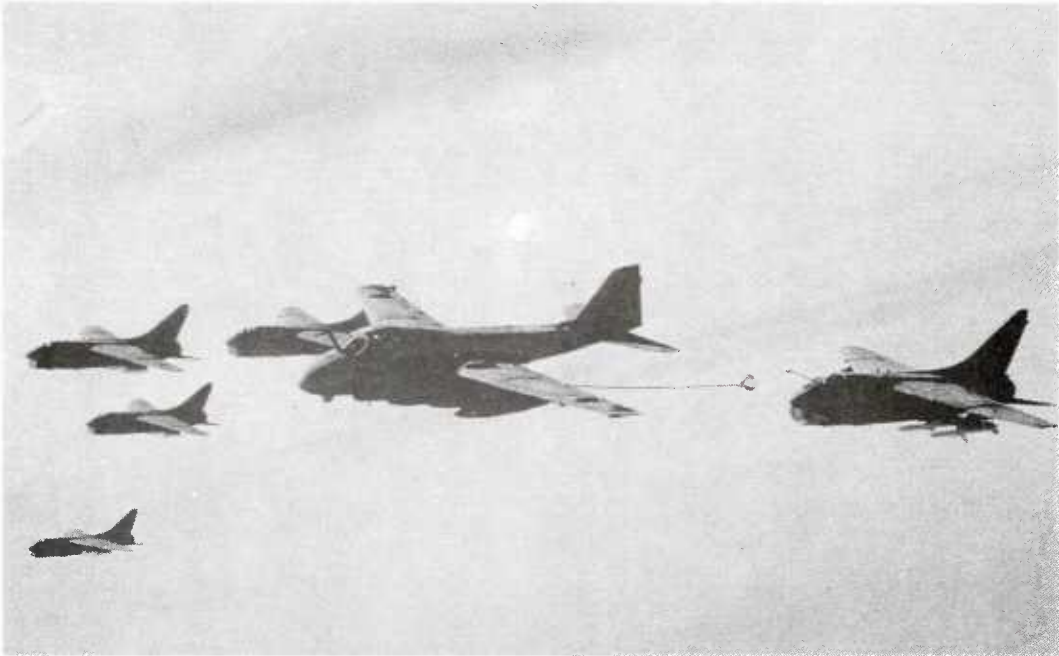
Figure VI-34

HC-130 Refuels Helicopters (HH-53, Left, HH-60, Right) While Training for Deep Reconnaissance Missions During Operation Desert Storm

air refueling task dictated that a tanker liaison be added to the AWACS airborne command element team on one of the five AWACS airborne at any given time.

One limiting factor for tanker operations was a lack of multipoint-equipped land-based tankers, although quick flow procedures for cycling aircraft off a single boom worked adequately in most cases. Airspace congestion also was a limiting factor. Strike package size sometimes was constrained by the number of tankers that could be scheduled into the heavily congested air refueling tracks. This was another Coalition air operation made more efficient through the unity of effort provided by the JFACC and the ATO. That there were no midair collisions between different packages was a tribute to the skill and professionalism of Coalition aircrews and the firm control of available airspace.

The Red Sea battle force was allocated about twice as many tanker sorties as the Persian Gulf battle force, because of greater flight distances to assigned targets and because initial strike plans required two carriers to strike targets simultaneously from the Red Sea. Most tankers used for these sorties were either KC-135Es or KC-135Rs. To increase availability of refueling hoses, Navy KA-6 and specially equipped S-3s accompanied many KC-135 formations.

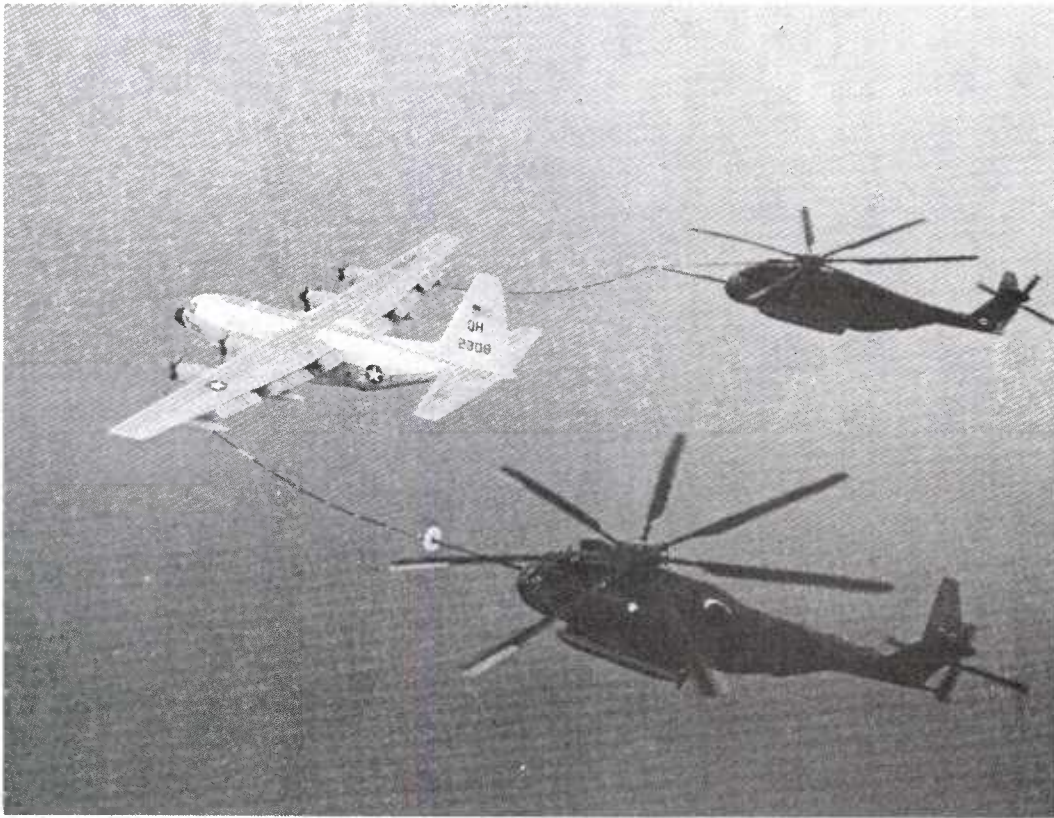


*Figure VI-35
A KA-6 Tops Off a Flight of A-7 Aircraft.*

On the afternoon of 17 January, two Air Force Reserve KC-135 tanker crews were orbiting near the Iraqi border, awaiting post-strike refueling requirements. An E-3A advised that a flight of four F-16s, some with battle damage and all low on fuel, were coming back from deep in central Iraq and needed immediate assistance. The two KC-135E tankers turned northwards into Iraq and towards the F-16s. Inside Iraqi airspace without fighter escort, and lacking good intelligence on the possible anti-aircraft artillery and surface-to-air missile threat along the route, they located and joined up with the F-16s and provided enough fuel for the safe recovery of one battle-damaged and three fuel-starved aircraft.

CENTAF After Action Reports

Processing large strike packages through the single-boom tankers was time consuming; by the time the last aircraft had refueled, the first aircraft had burned up much of the fuel it had received. Tanking procedures evolved to include Navy organic tankers with the strike packages; the Navy tankers refueled from the USAF single-point and RAF multi-point tankers and helped refuel the rest of the strike package en route to the target.



*Figure VI-36
A KC-130 Refuels Two CH-53Es.*

Practice during Operation Desert Shield allowed other Services' pilots to become accustomed to refueling from the large USAF tankers. During Operation Desert Storm, this familiarity paid off, especially when tankers escorted attack aircraft over enemy territory to extend their range.

Strike packages from the Persian Gulf carriers evolved away from a reliance on ATO-scheduled tanking as the carriers moved north in the Gulf. The reduction in the range to targets and the consequent shift to normal carrier launch and recovery operations on 4 February substantially decreased the requirement for land-based refueling aircraft. After the fleet's arrival in the northernmost carrier operating areas on 14 February, Navy refueling aircraft provided virtually all refueling for Persian Gulf naval air strikes.

The USMC maintained 20 KC-130 refuelers in Bahrain and Saudi Arabia to support fighter, attack, and helicopter missions. Usually operating in a cell of three

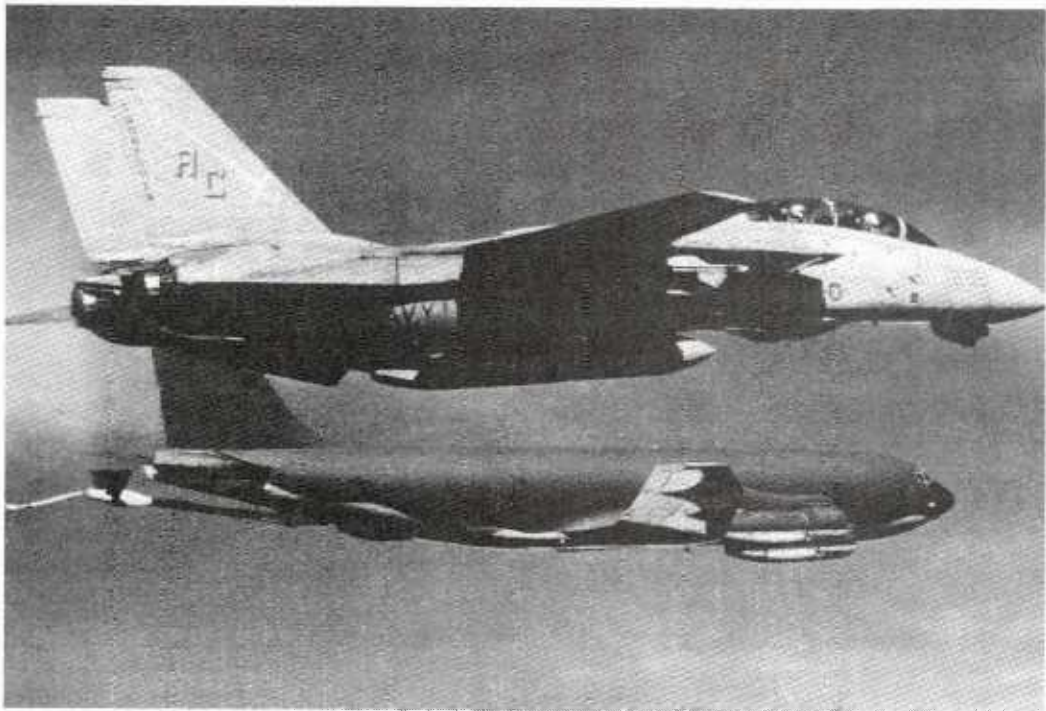


Figure VI-37
USAF KC-135 Tanker with Navy F-14 Fighter.

"The many strike rehearsals flown by USS Kennedy and USS Saratoga really paid off that first night. It went just like clockwork. We launched right on time at 0115; over 70 aircraft from the two carriers. The Air Force tankers were right on time, on altitude and on speed. We were really pumped up as we hit the tankers for that first drink heading north toward the Iraqi border."

Red Sea Battle Force Air Wing Commander

to five aircraft, the KC-130s refueled strike packages before and after missions in southern or central Iraq, flying 1,271 missions.

Aerial refueling operations normally are conducted in a no- or low-threat area, for obvious reasons. During Operation Desert Storm, however, Coalition tankers occasionally had to fly over hostile territory to enable strike forces to reach their targets, or to prevent the loss of fuel-starved Coalition aircraft. They flew over southern Iraq, for example, to refuel the fighters flying barrier patrols between Iraq

and Iran. An SA-8 SAM exploded above a JTF Proven Force KC-135 tanker flying out of Incirlik.

Aerial refueling coordination with carrier-based aircraft was complicated by two requirements: JP-5 fuel which, because of its relatively high combustion temperature is used aboard ships for safety considerations, and basket adapters to fit KC-135 tankers for probe refueling. KC-10 tankers had the flexibility while airborne to refuel aircraft with either a basket or boom configuration, but the KC-135 had to be configured with a basket adapter before takeoff to refuel Navy, USMC, or most other Coalition aircraft.

Reconnaissance and Surveillance

Airborne reconnaissance and surveillance played a key role in Operations Desert Shield and Desert Storm. The Coalition's ability to monitor and control the battle area confirmed the Iraqis' ignorance of what Coalition forces were doing.

E-3B AWACS aircraft (among the first US assets to arrive in Saudi Arabia) maintained one to three 24-hour surveillance orbits during Operation Desert Shield. For Operation Desert Storm, this was expanded so the United States manned five orbits (four in Saudi Arabia and one in Turkey) and the RSAF manned one to three. With these orbits, AWACS provided comprehensive radar coverage 24 hours a day throughout the war. AWACS gave early warning of Iraqi air attack or other Iraqi Air Force movements, and helped control engagement of Iraqi aircraft. It also supported Coalition strike packages, and provided airborne surveillance and threat warning for other airborne assets such as SOF and CSAR missions.

U-2R and TR-1 aircraft provided valuable reconnaissance using a variety of sensors, and satisfied imagery collection requirements that could not be met by other collection sources. Initially, the aircraft remained over friendly territory but, when air supremacy was achieved, missions began to fly over Iraq.

RC-135 *Rivet Joint* aircraft was the first on-scene airborne reconnaissance system, flying the first operational sortie enroute from Hellenikon Air Base, Greece, to Riyadh on 9 August.

Naval electronic reconnaissance squadrons provided crucial support to Coalition forces beginning 7 August.

The 3rd MAW also flew the *Senior Warrior* package aboard a USMC Reserve KC-130T in support of MARCENT and the CENTCOM intelligence gathering effort.

Though still in development, CINCCENT requested E-8 JSTARS to be deployed in mid-December to give Coalition forces a tactical edge in combat. JSTARS provided theater commanders and other tactical users an NRT capability to locate and track

moving ground targets across a wide area and quickly relay this information to air and ground commanders. The two JSTARS aircraft flew an 11-to-13 hour mission daily throughout Operation Desert Storm, with all sorties taking off in late afternoon or early evening. The aircraft usually flew in an eastern orbit just south of the KTO, where they were able to monitor ground activity. They also operated from a western orbit in northern Saudi Arabia near the Iraq/Jordan border to detect and track Scud launchers. An orbit in north central Saudi Arabia supported the Army's XVIII Airborne Corps before and during the Offensive Ground Campaign.

JSTARS tasking for the air campaign was to locate and target high-value armor, army forces, and resupply activity in the KTO (including the area encompassing the Republican Guard and secondary echelon forces). JSTARS also was tasked to find and target Scud locations, gather intelligence on the movement of forces within the KTO and eastern Iraq, and validate targets for other weapons systems. For the ground campaign, JSTARS was tasked to locate and target movement within the second echelon forces with emphasis on the Republican Guard, provide intelligence on the movement of forces within the KTO and eastern Iraq, and respond to immediate requests for support of engaged ground forces.

The information JSTARS provided during the ground offensive allowed CINCCENT to make key operational decisions at crucial moments. JSTARS found significant target groups, such as convoys. JSTARS detected the Republican Guard movement and massive retreats from Kuwait City during the ground offensive, which gave CINCCENT the opportunity to press the attack and destroy the Iraqi forces while they were moving.

Navy E-2C aircraft were the first US airborne early warning (AEW) and C2 assets in theater. They provided continuous AEW, and were deployed to Bahrain during Operation Desert Shield to fill AWACS radar surveillance gaps. During Operation Desert Storm they primarily operated off aircraft carriers.

The E-2C was crucial for carrier-based naval aviation – it synthesized information, analyzed and corrected battlefield problems, and provided a more complete picture for strike leaders and warfare commanders. E-2Cs flew around the clock from carrier battle groups in the Red Sea and Persian Gulf, fusing tactical and strategic intelligence from AWACS, Aegis, and other assets to produce a comprehensive picture of the KTO. Airborne controllers provided tailored tactical control, intelligence filtering, and friendly forces deconfliction, and improved the situational awareness for Navy strike groups as well as other Coalition forces.

P-3 and S-3 aircraft made important contributions to maritime interception force operations, antisurface warfare, strike support, and the counter-Scud campaign. The Navy and USMC both used EA-6Bs to good effect.

Forward Operating Locations (FOLs) Forward Area Rearming and Refueling Points (FARPs)

Both the USMC and USAF attempted to base their primary attack assets at a home base, but also operated from FOLs to get closer to the target areas. The USAF based its A-10s at King Fahd International Airport in Saudi Arabia and operated from two FOLs, especially King Khalid Military City, while the USMC AV-8Bs operated from King 'Abd Al-'Aziz Naval Base as well as additional FOLs and forward area rearming and refueling points (FARP) near the Kuwaiti-Saudi border.

Before G-Day, the USMC established FARP for both fixed- and rotary-wing aircraft in northern Saudi Arabia. These locations allowed quicker aircraft response times. Fixed-wing sites were established at Al-Jubayl for F/A-18s and at Tanajib for AV-8Bs and OV-10s. The assets needed to refuel, rearm, and provide normal maintenance were at these sites; intelligence briefings and debriefings also were conducted. At Tanajib, an ARAMCO facility 35 miles south of the Kuwaiti border, AV-8B operations began on 18 February. AV-8Bs were able to rearm and refuel within 17 to 25 minutes and could reach the Kuwait border in five to seven minutes. The FARP allowed AV-8B aircraft to range farther north, without aerial refueling. These locations proved extremely valuable in attacking Iraqi troops in the I MEF area. FARP also allowed returning pilots an additional base for low fuel and other problems.

USMC rotary wing squadrons also deployed forward. AH-1s maintained a strip alert of four aircraft at Ras Al-Mish'ab, 27 miles south of the Kuwaiti border, beginning on D-Day. These aircraft responded to close-in fire support requests at Al-Khafji and during the ground offensive. Helicopter squadrons also deployed to Tanajib on 2 February, and on 16 February to a USMC expeditionary base in the desert, south of the "elbow," the bend in the Kuwaiti border. This base, which included an AM-2 matting air strip, was named Lonesome Dove.

HUMINT Assistance to Targeting Process

Identifying military targets was difficult; however, information acquired by HUMINT operations improved targeting and destruction of significant military facilities in Baghdad, including the MOD and various communications nodes. In addition to blueprints and plans, HUMINT sources provided detailed memory sketches and were able to pinpoint on maps and photographs key locations, which subsequently were targeted.

Sources detailed the locations of bunkers underneath key facilities, including the Iraqi Air Force headquarters, which was composed of several main buildings and five underground bunkers, and the Iraqi practice of stringing coaxial communications cable under bridges rather than under the river beds in Baghdad

and southern Iraq. This information was the deciding factor in the decision to target key bridges in Baghdad. Sources identified the communications center in Baghdad; less than 12 hours later, this facility was destroyed. Information obtained from EPWs also helped planners direct effective air attacks against troops and logistics targets.

Battle Damage Assessment

While the intelligence support to CENTCOM was considered an overall success, the BDA process was only a limited success. The following recounts some of the problems and successes with BDA support for the air campaign (see Appendix C).

The BDA process at the theater level suffered from a lack of adequate systems, procedures, and manpower and had difficulty trying to keep pace with the size, speed, and scope of the air campaign. Not since Vietnam had the DOD Intelligence Community been faced with such a large scale BDA challenge. With the beginning of Operation Desert Shield, DIA began extensive preparations to provide BDA to CENTCOM. These preparations included 13 DIA-led end-to-end exercises of imagery dissemination, and training for DIA personnel, as well as other participants. CENTCOM and its components took part in these preparations; however, not all aspects of the BDA architecture, especially within theater, were tested fully before Operation Desert Storm.

Further, the BDA process was not fully synchronized with the attack planning process. The air operations tempo and the massive number of targets outstripped the established system for collecting and reporting intelligence. This complicated the intelligence collection strategy and generally delayed BDA analysis and reporting. Additionally, BDA primarily relied on imagery and was severely hampered by bad weather. Even some of the better imagery analysts had difficulty assessing degrees of damage for targets not catastrophically destroyed.

Coupled with massive, fast-paced air attacks, it was difficult to provide aim point and damage criteria specifics in the MAP and ATO. Instead, planners at the air wing level often were forced to rely on cockpit video, pilot reports, and limited organic intelligence and planning capabilities to choose the best attack options and aimpoints. Doing that required access to recent target imagery and BDA information, which often were neither timely nor adequate. At times, this led to unnecessary restrikes.

At the tactical level, few assets were available to collect BDA after artillery or air strikes. Frustration at this level was increased by the competition at higher echelons for limited national intelligence collection assets. Further, communications down to the tactical level often were not adequate to pass reconnaissance results. Moreover, the disseminated BDA often was not useful to some tactical commanders. There was no system specifically designed to provide feedback from the tactical user to the national level producer.

Although BDA inputs from many different intelligence agencies were frequent and often timely, fusion of the BDA at the theater level posed problems. Throughout the war, damage assessment and intelligence information to support decisions to restrike particular targets were piecemeal affairs, requiring individual users, whether on a carrier or in Riyadh, to synthesize assessments independently.

The desire not to overstate operational accomplishments led to assessing damage based only on what could be proven using imagery. In some cases, this seems to have precluded making rapid judgments about what probably had been accomplished.

This practice did not serve well the needs of commanders operating under combat time pressures. They could not wait for in-depth analysis; decisions had to be made based on judgment. Consequently, planners were forced to make their own assessments of how attacks were succeeding, and whether restrikes were needed. In addition, some agencies doing BDA did not have some essential planning data, such as, the desired aimpoint, weapon destruction information, the target list priority, or the desired damage level.

Finally, neither training doctrine nor training standards existed; consequently, damage analysts were too few and not adequately trained to assess the effects of penetrating weapons or special weapons which typically reveal little visible damage beyond the entry hole.

The Defense Nuclear Agency (DNA) provided Checkmate with vulnerability analyses of Iraqi underground facilities. These analyses were submitted in a report format designed as a quick reference for attack planning. Requests for DNA assistance from Checkmate were handled on a rapid reaction basis; DNA's assessments usually were provided directly to the Checkmate staff within hours of the request. In addition, DNA received BDA data and provided munitions effectiveness assessments to Checkmate and DIA to help CENTCOM planning. (For additional assessment of BDA, see Appendix C.)

Ultimately CINCCENT relied upon a synergistic approach to determine BDA across the board and within individual target categories. He meshed BDA assessments from DIA and other national agencies and tactical reconnaissance (which tended to be conservative) with mission reports (which tended to be inflated) and gun camera imagery to provide a balanced assessment of the air campaign.

Space Systems

The war with Iraq was the first conflict in history to make comprehensive use of space systems support. All of the following helped the Coalition's air, ground, and naval forces: The DMSP weather satellites; US LANDSAT multi-spectral imagery

satellites; the GPS; DSP early warning satellites; the tactical receive, equipment and related applications satellite broadcast; the Tactical Information Broadcast Service; as well as communications satellites. Space systems communications played a central role in the effective use of advanced weapon systems. (For more detailed discussion, see Appendices K and T.)

The largely featureless KTO terrain made precise electronic navigation crucial to many missions and functions. GPS was used by TLAM launch platforms to obtain accurate firing positions; by artillery for accurate targeting; by aircraft for more precise navigation; by SLAM for flight guidance; by minesweeping ships and helicopters to maintain accurate sweep lanes; by Navy CSAR and USMC medical evacuation helicopters to locate downed airmen or injured ground troops; and by many other units to provide grid locations for navigation aids and radars.

DSP was the primary Scud launch detection system during Operation Desert Storm. The DSP constellation and associated ground station processing provided crucial warning data of Scud launches. This data was disseminated by a variety of means. The national military command center used DSP data to provide military and civilian warning to Israel and the Gulf states.

Civilian Casualties and Collateral Damage

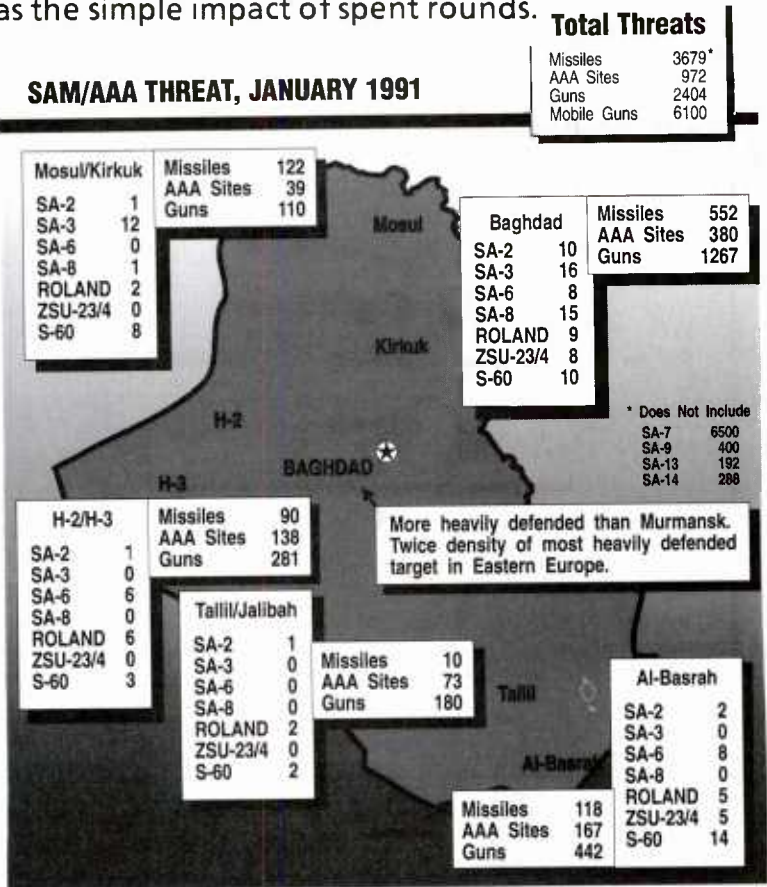
From the beginning, Coalition objectives made a clear distinction between the regime and the Iraqi populace – the regime and its military capabilities were the target; the Iraqi people were not.

Coalition planners followed stringent procedures to select and attack targets. Attack routes were planned to minimize the results of errant ordnance; the norm was to use PGMs, rather than less-accurate gravity weapons, in built-up or populated areas. Attack procedures specified that if the pilot could not positively identify his target or was not confident the weapon would guide properly (because of clouds, for example), he could not deliver that weapon. Several attack sorties were forced to return with their bombs for this reason.

Coalition planners recognized not all weapons would perform in every case as designed and, despite all efforts to prevent collateral damage, some would occur. Although the death or injury of any civilian is regrettable, the apparently low number clearly reflects Coalition efforts to minimize civilian casualties.

As discussed in Appendix O (The Role of Law of War), the problem of collateral civilian casualties was worsened by Saddam Hussein's failure to carry out routine air raid precautions to protect the civilian population and his conscious use of civilians to shield military objectives from attack.

There is also a probability that some casualties occurred when unexploded Iraqi SAMs or AAA fell back to earth. The often dense fire the Iraqis expended in attempts to shoot down Coalition aircraft and cruise missiles almost certainly caused some destruction on the ground from malfunctioning fuses or self-destruction features, as well as the simple impact of spent rounds.



Map VI-13
Surface-to-Air Missile and Antiaircraft Artillery Threat

Aircraft Vulnerabilities to SAMs and AAA

All aircraft are vulnerable to radar-guided weapons unless the radar tracking system can be denied crucial information such as altitude, heading, and speed. Coalition aircraft denied much of this information through stealth, jamming or chaff, and attacks on the radar systems (using bombs and missiles). Coalition aircraft also had to nullify the Iraqis' IR tracking systems; this was more difficult because jet exhausts produce heat. IR sensors cannot be jammed, but they can be defeated or fooled by flares the sensors detect.

The Coalition's aggressive SEAD defeated most Iraqi radar systems. This enabled Coalition aircraft to conduct operations in the middle altitudes (about 15,000 feet) in relative safety because they were less vulnerable to IR-guided SAMs or unguided AAA. One of the greater dangers Coalition pilots faced was from IR- or EO-guided SAMs while they were flying at relatively low altitudes, supporting Coalition ground forces. Although sortie rates were relatively constant, approximately half of its fixed-wing combat losses occurred during either the first week of Operation Desert Storm (17 aircraft), before enemy defenses had been suppressed, or during the last week (eight aircraft), when aircraft were operating at lower altitudes in the IR SAM threat region.

**Coalition Fixed-Wing Aircraft Losses
By Week Beginning D-Day**

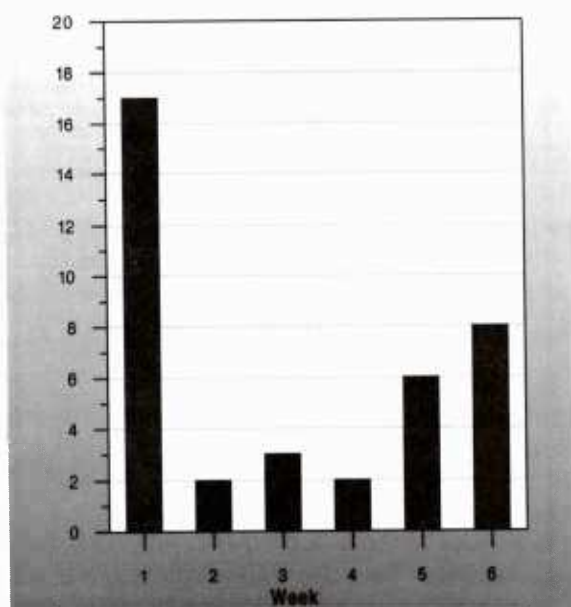


Table VI-11

Coalition Fixed-Wing Aircraft Combat Losses

Ten aircraft were lost during the final 10 days of the war (19 to 28 February), all in the KTO. During this period, Coalition aircraft often operated at lower altitudes, where the Iraqi defensive threat was still potent, to get below the prevalent bad weather and to support the ground forces better. This not only

exposed the aircrews to battlefield defenses, such as hand-held IR SAMs that were not a threat at the middle altitudes, but also reduced aircrew reaction time and ability to evade SAMs.

On the last day of the war, an A-10 pilot from the 511th Tactical Fighter Squadron was awaiting his next mission. Instead of an attack on the enemy, however, his last mission of the war offered a sobering reminder of the cost of freedom. It is best told in his own words: *"As we're on our way out the door [to his plane], I overhear that there's a hog [A-10 Warthog] coming in with battle damage. He's been hit by an infrared surface-to-air missile in the tail, and he's flying [with] no hydraulics. Tower asks if we would mind flying a CAP over the airfield while he comes in, [so] we take off. We are overhead when he comes across the threshold [the end of the runway]. He is lined up and everything looks good. All of a sudden the aircraft hits the threshold very hard, all three gear collapse and shear out from under him. The aircraft bounces about 40 to 50 feet into the air. It then rolls into the wind, to the right. The flight lead starts yelling into the radio, and someone on the ground yells for him to punch out. It is too late, though, he is probably unconscious from the hard landing. The aircraft rolls and hits nose first. He didn't have a chance – the aircraft instantly goes up into a ball of flame We park our jets and go through debrief. Not more than two words are said. The next day the war is over, and we have won a big victory. Some have paid a higher price than others."*

511 Tactical Fighter Squadron Unit History

OBSERVATIONS

Accomplishments

- Operation Desert Storm validated the concept of a campaign in which air power, applied precisely and nearly simultaneously against centers of gravity, significantly degraded enemy capabilities. Air power degraded much of the Iraqi command structure, markedly reduced military production, made the Iraqi Air Force ineffective, and significantly degraded the overall combat effectiveness of the Iraqi army in the KTO.
- The theater campaign strategy exploited wise investments, superior planning, people, training, doctrine, and technology to achieve surprise.
- Technology gave the Coalition a decisive edge. Stealth, PGMs, SEAD, C3I, air refueling, reconnaissance and surveillance aircraft, space systems, night-fighting capabilities, tactical ballistic missile defense systems, logistics systems, airlift and sealift, cruise missiles, attack helicopters, remotely piloted vehicles, and flexible-basing aircraft made major contributions.
- The revolutionary combination of stealth aircraft and PGMs allowed nearly simultaneous attack against scores of targets across the theater. They enabled a relatively small number of offensive assets to attack effectively many more targets than would have been possible without stealth (which requires little airborne support) and PGMs (which require few munitions to achieve the desired effect). Without these capabilities, the attacks would have required many more sorties, and would have been much more costly. Many attacks would have been impractical (because they would have caused too much collateral damage or would have required too many assets) or impossible (because the desired level of damage against pinpoint or hardened targets could not have been achieved with conventional munitions).
- The TLAM played an important role in the air campaign as the only weapon system used to attack central Baghdad in daylight. The cruise missile concept – incorporating an unmanned, low-observable platform able to strike accurately at long distances – was validated as a significant new instrument for future conflicts.
- The JFACC concept was validated. JFACC planning, coordination, allocation, and tasking of apportioned sorties and capabilities secured unity of effort.
- Planning for air campaign levels of enemy force destruction, and crippling of enemy C3 and logistics generally was accurate, despite the unusually bad weather. NBC destruction estimates suffered from incomplete target set information. Scud suppression, expected to be difficult, proved very much so.

- Mission capable maintenance rates were higher for most aircraft than peacetime rates, despite harsh desert conditions, high sortie rates, and flight under combat conditions.
- Despite difficulties with BDA, the NCA and Coalition commanders rated intelligence support to Operation Desert Storm as the best for any war. Improvements always are possible, but the intelligence and operations communities worked together, although sometimes in nonsystematic, innovative ways, to produce careful targeting and successful execution of massive air and ground campaigns.
- An *ad hoc* BDA system was developed using both objective (physical evidence) and subjective (military judgment) analysis, to determine damage inflicted by air power to strategic and operational targets.
- *Ad hoc* cooperative efforts injected hardened target vulnerability expertise directly into the real-time targeting process. However, Operation Desert Storm experience demonstrated that such operations should be practiced to maximize effectiveness during future conflicts.

Shortcomings

- The lack of PGM capability on many US aircraft required planners to select less-than-optimum attack options, such as delaying attacks or assigning multiple sorties with non-precision munitions. Operation Desert Storm results argue that a higher percentage of US attack aircraft should have PGM capability to increase the amount of target damage that can be inflicted by a finite number of aircraft.
- There was no published joint guidance on TLAM use. A joint TLAM strike-planning manual should be developed.
- Operation Desert Storm highlighted the need for high resolution systems for capturing and rapidly exploiting mission results to allow accurate and timely BDA. Many aircraft that flew in the war had no system or a system that did not meet the BDA needs of a large-scale, rapid war, in which air attacks generated most BDA requirements.
- In the Persian Gulf War, some target sets, such as electrical power production, were more heavily damaged than originally planned. As exceptions to the general targeting guidance to minimize long-term damage, some electricity-producing facilities purposely were severely damaged to ensure they remained unusable for the entire conflict. In some instances, wing-level planners were not briefed adequately on air campaign objectives. For example, JFACC planners had decided to target the switching systems at electrical power

plants because they are easier to repair than other plant facilities. Unfortunately, this direction was not always passed to the units in the form of aimpoints in the ATO; this left some units to select their own aimpoints. As a result, many generator halls – which are easier to strike, but harder to repair – were damaged heavily. BDA limitations further complicated targeting. BDA sometimes was slow to reach air planners and did not assess fully the effects of modern munitions. Because disrupting electricity was time-crucial and considered vital to protect aircrew lives and ensure mission accomplishment, and BDA might never provide complete assessments of damage effects, commanders, based on the information available at the time, sometimes directed additional attacks. In some cases, this resulted in additional damage at facilities that apparently already were out of operation.

- Although there were no ground-to-air or air-to-air losses caused by fire from friendly forces, some air-to-ground fire from friendly forces took place during the air campaign. (See Appendix M for discussion)
- The lack of a tested, fully coordinated BDA system to support CENTCOM needs was a problem.
- VTR imagery was very useful in Operation Desert Storm for providing BDA of PGM attacks. For the future, the resolution and overall capabilities of these sensors need to be improved to handle a variety of weapon delivery tactics at different flight levels. VTR for BDA should be provided to all attack aircraft. To obtain higher resolution, use of low-light-level, high-definition TV should be considered along with IR systems.

Issues

- The theater Commander-in-Chief has the key role in theater-level targeting, but this role is not clearly defined in joint doctrine. This lack of definition caused confusion and duplication. Ground force commanders expressed discontent with the JFACC targeting process for not being responsive to pre-G-Day targeting nominations. On the other hand, the JFACC targeting process reacted to CINCCENT direction regarding priorities and maintenance of the overall deception plan. Difficulties were experienced in nominating and validating targets. CINCCENT has recommended, for future major military operations, the JFACC be staffed with personnel from all using as well as providing Services. This issue will be addressed in the DOD joint doctrinal development process.
- Before Operation Desert Shield, the USAF had already begun developing an upgraded force management and planning system to replace CAFMS, which is relatively slow, and not fully interoperable with the other Services. The Services are working together on an interoperable follow-on system that will help shorten the ATO planning cycle.

- Prudence dictates that national defense planning assume future adversaries will be more adept, better equipped, and more effective than Saddam Hussein.
- Although the Coalition was able to take advantage of favorable environmental conditions in this war, in the future, elimination of an adversary's stockpile of chemical and biological weapons before deployment or use, with current conventional weapons inventories, is problematic.
- Locating and destroying mobile missiles proved very difficult and required substantially more resources than planned. This could be a more serious problem in the future against an enemy with more accurate missiles or one who uses weapons of mass destruction.
- More countries are expected to acquire ballistic missiles and will be prepared to use them in future conflicts. Tomorrow's forces must be defended against the more advanced missiles that soon will be found in some third world arsenals, perhaps armed with unconventional warheads. Continual expansion of the threat, as illustrated by Iraqi Scud attacks, indicates antiballistic missile defensive capabilities and counterforce location and targeting must be improved.
- It appears at least 15 Coalition aircraft were lost to AAA or IR SAMs. When aircraft operated at lower altitudes to ensure target acquisition and destruction, they became more vulnerable to IR SAMs and AAA. SEAD can reduce, but not eradicate, these threats. All aircraft require improved protection. Possible improvements could come from automatic warning systems to indicate to the pilot his aircraft is being targeted by IR-, EO-, or radar-guided SAMs, and automatic defensive systems to react to the threat. Improved flares also may help.
- There is a need to field an all-weather reconnaissance system to provide NRT battlefield intelligence and BDA at long range.
- Future adversaries may be expected to invest in protective shelters and bunkers for aircraft and C2 facilities. As other nations study the lessons of Operation Desert Storm, they may see the importance of a more balanced approach to passive air defenses. Shelters may be strengthened or facilities may be dispersed and made more mobile to avoid the increased likelihood that fixed targets will be vulnerable to attack. Further development of anti-hardened shelter weapons, methods for distinguishing decoys from targets, and methods to react quickly to mobile targets, all remain important issues.

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CHAPTER VII

THE MARITIME CAMPAIGN

"We continued heavy operations out in the sea because we wanted the Iraqis to believe that we were going to conduct a massive amphibious operation. The Iraqis thought that we were going to take them head on into their most heavily defended area. We launched amphibious feints and naval gunfire so they continued to think we were going to be attacking along the coast, and therefore fixed their forces there. Our hope was that by fixing the forces in this position and with a ground attack [from the south], we would basically keep the forces here [in southern Kuwait] and they wouldn't know what was going on out in this area [west of Kuwait]. We succeeded in that very well."

General H. Norman Schwarzkopf
Commander-in-Chief, Central Command

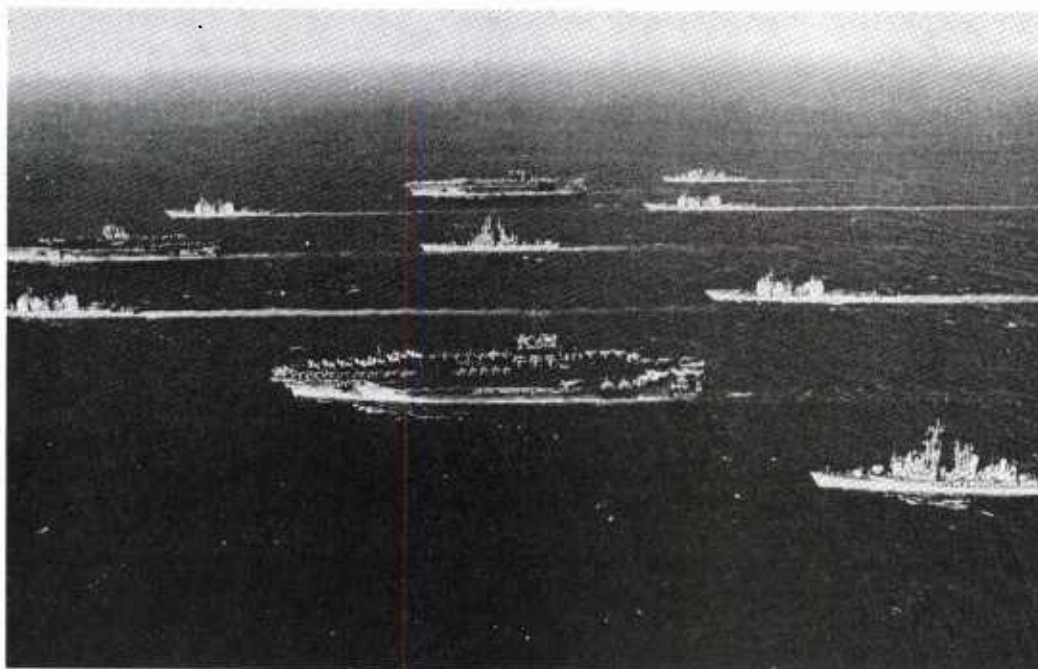


Figure VII-1

Part of the Red Sea Battle Force (from left): USS Thomas S. Gates (CG 51), USS Saratoga (CV 60), USS San Jacinto (CG 56), USS John F. Kennedy (CV 67), USS Mississippi (CGN 40), USS America (CV 66), USS William V. Pratt (DDG 44), USS Normandy (CG 60), USS Philippine Sea (CG 58) and USS Preble (DDG 46)

INTRODUCTION

The Navy benefited from years of operating experience in the harsh Middle East environment. Because there were no permanent US bases in the area, forward-deployed ships became increasingly important in the region. The Joint Task Force Middle East (JTFME) ships operated daily in the Persian Gulf before 2 August, conducting training exercises with Gulf Cooperation Council (GCC) nations, while their forward presence protected shipping routes.

In addition to the JTFME surface combatants, the United States routinely maintained an aircraft carrier battle group (CVBG) in the Indian Ocean (Figure VII-2). This battle group was tethered to the Persian Gulf region, requiring it to be in a position ready to respond to a crisis within a designated time period to support the National Command Authorities. As the Middle East political climate changed, this tether was shortened when tensions rose and lengthened during periods of stability.

The eight forward-deployed JTFME ships in the Persian Gulf, along with the *USS Independence* (CV 62) CVBG in the Indian Ocean and the *USS D. D. Eisenhower* (CVN 69) CVBG in the eastern Mediterranean Sea, were the only sustainable US combat forces nearby when Iraq invaded Kuwait. By 7 August, the *Independence* and *Eisenhower* battle groups (and embarked air wings) were operating under Commander-in-Chief, Central Command (CINCCENT) control. Eventually, the Persian Gulf conflict brought together the largest naval force assembled in a single theater since World War II.

This chapter first discusses the importance of sea control in Operations Desert Shield and Desert Storm, and then reviews the planning and execution of Operation Desert Storm's maritime campaign, which was conducted to support the theater campaign. In this report, the maritime campaign is addressed by warfare area: antisurface warfare (ASUW), antiair warfare (AAW), countermine warfare, naval gunfire support (NGFS), and amphibious warfare. Each naval warfare area generally presents the specific Iraqi capabilities, followed by a discussion of Coalition capabilities in that area, and then a chronological description of significant operations. Also included is a discussion of the role US submarines played in support of Operations Desert Shield and Desert Storm. This chapter concludes with a maritime campaign summary followed by an observations section that lists significant accomplishments, shortcomings, and issues. (Chapter IV discusses Maritime Interception Operations (MIO) and Chapter VI discusses naval aviation's contributions to the air campaign.)

USS John F. Kennedy Carrier Battle Group

Aircraft Carrier



USS John F. Kennedy

Carrier Air Wing Three



F-14 (22)



A-7 (24)



A-6 (13)
KA-6 (3)



E-2 (5)



EA-6 (5)



S-3 (8)



SH-3 (6)

Ticonderoga Class Aegis Cruisers



USS San Jacinto
USS Thomas S. Gates

Virginia Class Nuclear Powered Cruiser



USS Mississippi

Spruance Class Destroyer



USS Moosbrugger

O.H. Perry Class Frigate



USS Samuel B. Roberts

Sacramento Class Combat Logistics Force Ship



USS Seattle

Figure VII-2

THE IMPORTANCE OF SEA CONTROL

As the Coalition formed and plans were developed to restore the independence of Kuwait, the Navy set about classic naval missions – sea control and power projection. During the Persian Gulf conflict, the United States deployed more than 165 ships, including six carrier battle groups with embarked air wings, to the Persian Gulf, Arabian, Red, and eastern Mediterranean Seas. Other Coalition nations deployed more than 65 ships to Southwest Asia (SWA). As a result, the Coalition's

control of the seas was never in question and naval forces made significant contributions to operations against Iraq.

Sea control allowed the Coalition to isolate Iraq from outside support. Maritime Interception Operations cut off Iraqi trade. In addition, sea control assured the free use of the sea lines of communication for the deployment of Coalition forces. Sealift carried 95 percent of the cargo required for Operations Desert Shield and Storm. As demonstrated during the Iran-Iraq War, mines, missile-firing patrol boats, antiship-missile-firing aircraft, and land-based antiship missile systems were capable of damaging and disrupting seaborne commerce. Without control of the sea and the airspace over it, that cargo would have been at risk, slowing the deployment of forces and support equipment, threatening US ability to charter foreign merchant vessels, and substantially increasing shipping costs. Because Coalition naval forces controlled the seas, this sealift effort was never challenged.

Control of the seas also permitted carrier battle groups to make maximum use of their mobility. Mobility is one of the carrier battle group's greater advantages. The *America* CVBG, initially used during the Strategic Air Campaign against targets in western Iraq, moved from the Red Sea to the Persian Gulf in early February. This redeployment reinforced the Persian Gulf battle force's participation in tactical operations against Iraqi forces in Kuwait. Similarly, repositioning the Persian Gulf battle force to operating areas farther north reduced the range to targets, thereby increasing the sortie rate of aircraft flying from those carriers. Mobility also made it possible to diversify attack axes against Iraq (from the Red Sea, GCC states, and the Persian Gulf), and provided the Coalition aircraft operating bases out of range of Iraq's short-range ballistic missile and chemical warfare threats.

Establishing control over the Persian Gulf also prevented Iraq from mounting small-scale surprise attacks against the coastlines of Saudi Arabia, the United Arab Emirates (UAE), Qatar, Bahrain, and Oman. During the Iran-Iraq War, both sides demonstrated the ability to attack both ships in the Persian Gulf and coastal facilities. Thus, Coalition naval forces were required to maintain constant vigilance against attacks from Iraq and Iran. At the same time, naval forces in the Persian Gulf added depth to the air defenses protecting Gulf states and the right flank of Coalition forces.

Finally, establishing sea control in the Gulf was an essential prerequisite to any amphibious operations against the Iraqi left flank in Kuwait. Although an amphibious assault never occurred, preparations for such an assault were part of the theater campaign's deception. The threat of amphibious attack induced the Iraqis to fortify the coast, diverting manpower and material from the area of the Coalition's actual assault.

The maritime campaign highlighted the crucial importance of the ability to:

- Take control of the sea and air, and to exploit that control to affect the course and outcome of maritime operations, even in the enemy's own territory;

- Operate in coastal waters such as the Persian Gulf; and
- Insert forces ashore, possibly against opposition, and sustain combat operations.

Furthermore, the Persian Gulf War demonstrated once again that sea control is fundamental to successful power projection, and revalidated the importance of maritime superiority to US global leadership.

NAVCENT OPERATION DESERT STORM COMMAND ORGANIZATION

As plans were developed for offensive operations, additional strike forces were deployed to the theater to augment forces already in place. This deployment of additional forces permitted Naval Forces Component, Central Command (NAVCENT) to restructure the command organization and form two carrier battle forces. Ultimately, six CVBGs were merged into these battle forces. Initially, the *USS Midway* (CV 41), *USS Ranger* (CV 61), and *USS Theodore R. Roosevelt* (CV 71) battle groups comprised the Persian Gulf Battle Force, with Commander, Carrier Group (COMCARGRU) 5 aboard *USS Midway* as battle force commander. The *USS John F. Kennedy* (CV 67), *USS Saratoga* (CV 60), and *USS America* battle groups formed the Red Sea Battle Force, with COMCARGRU 2 aboard *USS John F. Kennedy* as commander. In February, *USS America* joined the Persian Gulf battle force to provide more strike assets to support the anticipated ground offensive.

In addition to the Red Sea and Persian Gulf battle forces, NAVCENT controlled other task forces (Figure VII-3). The Commander, Middle East Force (CMEF) maintained operational control of the extensive US Maritime Interception Force, as well as the US mine countermeasure (MCM) forces and the Middle East Force surface combatant squadron in the Persian Gulf. The amphibious task force (ATF), which included the Marine Corps (USMC) landing force embarked in amphibious ships, also was under NAVCENT control. During some operations, NAVCENT controlled the surface combatants and submarines in the Mediterranean Strike Group. NAVCENT also coordinated with the Navy's Atlantic, European, and Pacific fleets, which provided various forms of support (e.g., logistics, communications, intelligence, and maritime patrol aircraft (MPA) assets) to Operations Desert Shield and Desert Storm.

During Operation Desert Storm, NAVCENT exercised overall control of all warfare areas at sea, with Navy air strikes against occupied Kuwait conducted under the Joint Force Air Component Commander (JFACC) concept. NAVCENT assigned sea control and strike warfare tasks to his battle force commanders. Amphibious warfare tasks were assigned to the Commander, Amphibious Task Force (CATF) and the Commander, Landing Force (CLF) which comprised the ATF. NAVCENT's naval forces at sea implemented command and control (C2), for the most part, through the Navy's standardized Composite Warfare Commander (CWC) concept. This concept embodies a basic organizational structure, which enables the CWCs (who were the

NAVCENT Operation Desert Storm Command Structure

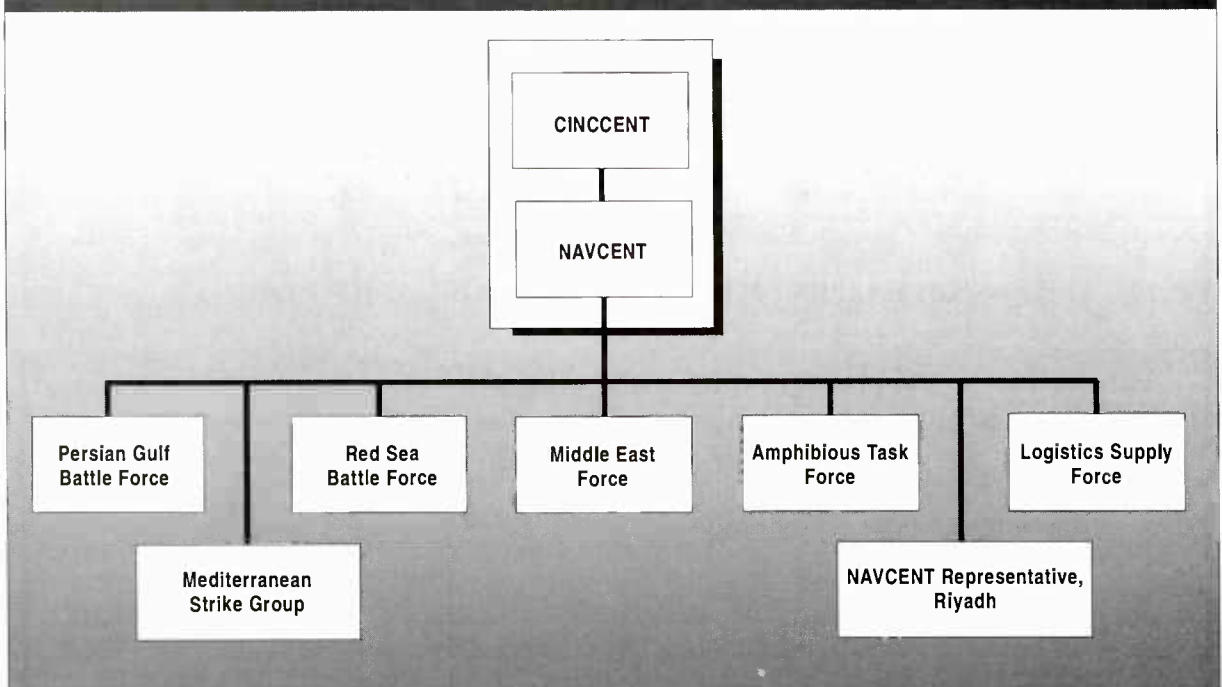


Figure VII-3

battle force and task force commanders during Operation Desert Storm) to wage combat operations against air, surface, and subsurface threats to accomplish primary missions (such as sea control, strike warfare, or amphibious operations). During Operation Desert Storm, NAVCENT assigned missions to the battle force and task force CWCs, who planned and directed the execution of those missions.

To conduct combat operations, the CWC designates subordinate warfare commanders within his command organization (Figure VII-4), who are responsible to the CWC for conducting strike warfare, AAW, ASUW, and antisubmarine warfare (ASW). (ASW was not used in Operation Desert Storm). The warfare commanders are responsible for collecting, evaluating, and disseminating tactical information; executing assigned missions; and, at the CWC's discretion, are delegated authority to respond to threats. A wide range of options exist for the delegation of command authority to the warfare commanders. Regardless of the amount of authority delegated, the CWC always retains the option to overrule his subordinate commanders' decisions, if required.

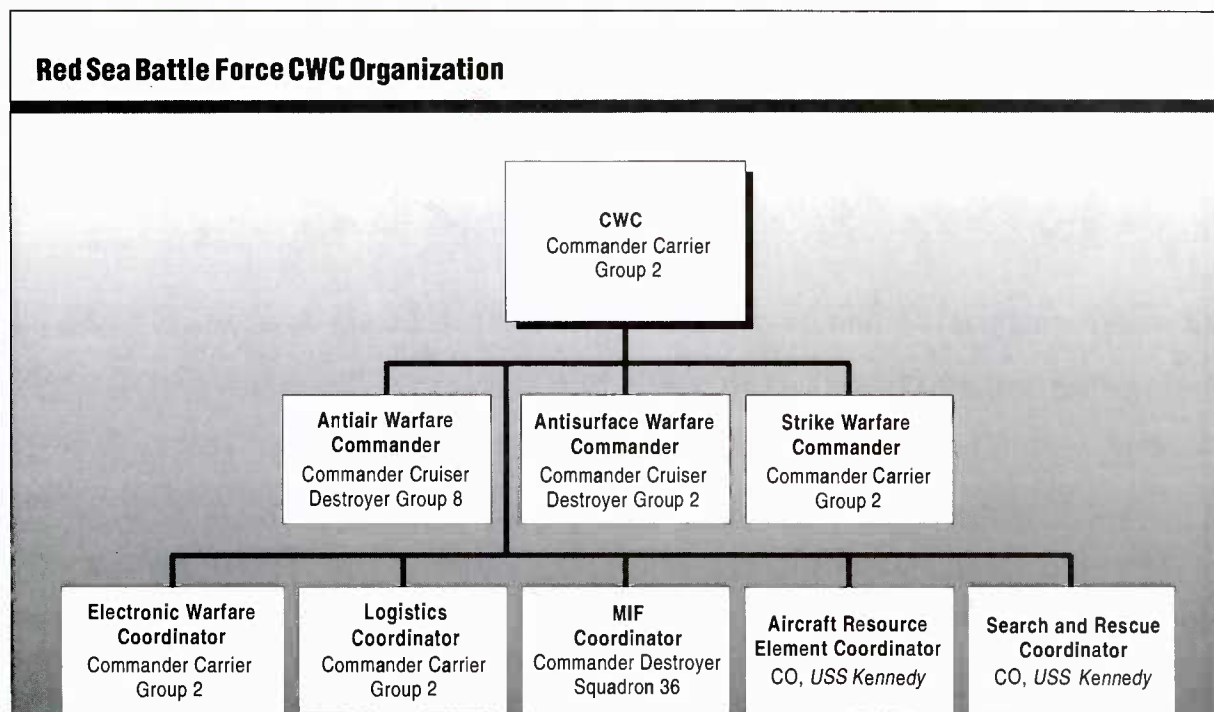


Figure VII-4

THE MARITIME CAMPAIGN PLAN

The key pedestals of CINCCENT's theater campaign plan were the air campaign, the ground campaign, and an amphibious invasion, which evolved into part of the theater campaign's deception. In addition to supporting the air campaign, NAVCENT's other primary objective was developing and maintaining this amphibious invasion capability. Even though an amphibious invasion did not occur, the amphibious invasion threat had to be credible to induce Iraq to commit a substantial part of its military forces to defending against this threat. In addition to maintaining a well trained ATF, conducting amphibious operations first required extensive efforts in ASUW, mine countermeasures (MCM), and NGFS. Along with the amphibious invasion, NAVCENT was responsible for defending the coastlines of Saudi Arabia, the UAE, Qatar, Bahrain, Oman and the adjoining maritime areas. During the Iran-Iraq War, Iraq had demonstrated capabilities that could threaten Coalition ports, such as Ad-Dammam and Al-Jubayl, as well as Coalition naval forces operating in the Gulf.

To support CINCCENT's theater campaign plan, NAVCENT's major tasks during Operation Desert Storm phases I and II (Strategic Air Campaign and Establishment of Air Superiority over the Kuwait Theater of Operations (KTO)) were:

- Conduct the air campaign in accordance with the Air Tasking Order (ATO);
- Establish sea control and conduct MCM operations in the northern Persian Gulf; and
- Attack shore facilities that threaten naval operations.

During Phase III, battlefield preparations, NAVCENT was tasked to carry out phase I and II tasks as well as attack Iraqi ground forces with aircraft and naval gunfire. During Phase IV, the Offensive Ground Campaign, NAVCENT was to:

- Continue to carry out phase I, II, and III tasks;
- Conduct amphibious feints and demonstrations in the KTO; and
- Be prepared to conduct an amphibious assault to link up with Marine Corps Component, Central Command (MARCENT) near Ash Shuaybah (Figure VII-6).

To accomplish these tasks, NAVCENT assigned the following primary missions to his battle force commanders in the Persian Gulf and Red Sea:

- Conduct naval operations in defense of Coalition ground, air, and sea units;
- Support Maritime Interception Operations;
- Provide naval tactical aircraft and TLAM strikes against Iraqi forces and assets;
- Establish naval control of shipping in designated areas and provide air defense of the Coalition sealift effort; and
- Coordinate and provide Combat Search and Rescue in the Red Sea and Persian Gulf.

The Persian Gulf Battle Force also was directed to provide close air support and NGFS to the ATF and Coalition ground forces as required. The Red Sea Battle Force also was tasked to ensure the freedom of navigation of vital sea lines of communication such as the Bab Al-Mandab Strait. NAVCENT directed the ATF to plan, prepare for, and conduct amphibious operations.

ANTISURFACE WARFARE (ASUW)

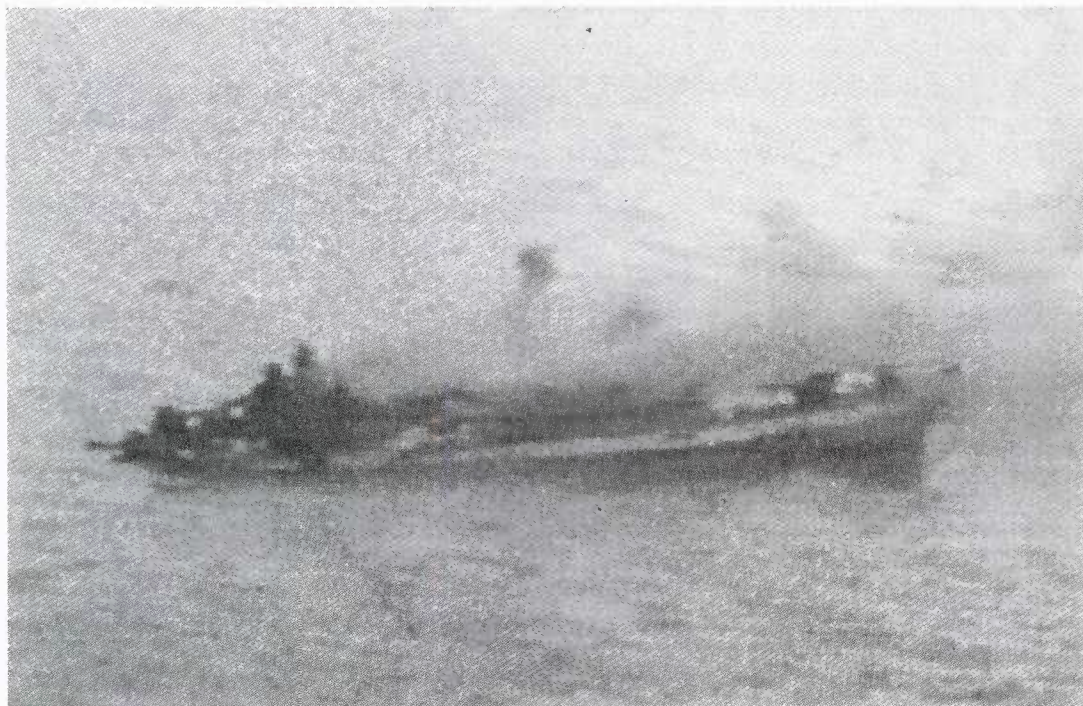


Figure VII-5
Severely Damaged Iraqi Polnocny Class Amphibious Ship

ASUW played an important role in the liberation of Kuwait. While Coalition naval forces continued MIO, the Navy, with assistance from the British Royal Navy, the Kuwaiti Navy, and the Royal Saudi Naval Force (RSNF) destroyed the Iraqi Navy. By using an aggressive and offensive ASUW concept during Operation Desert Storm, Coalition naval forces found and destroyed Iraqi naval vessels significantly beyond the range of enemy antiship missiles.

The Iraqi Threat

The Iraqi Navy and Air Force antiship capabilities posed a threat to Coalition naval forces in the Persian Gulf. The principal Iraqi port facilities and naval bases from which surface combatants could operate were concentrated near Al-Basrah, along the banks of the Shatt Al-'Arab, Iraq's only outlet to the Persian Gulf. Iraq also

had the potential to use Kuwaiti ports and facilities, as well as several oil platforms in the northern Persian Gulf, as bases for small boat operations (Figure VII-6).

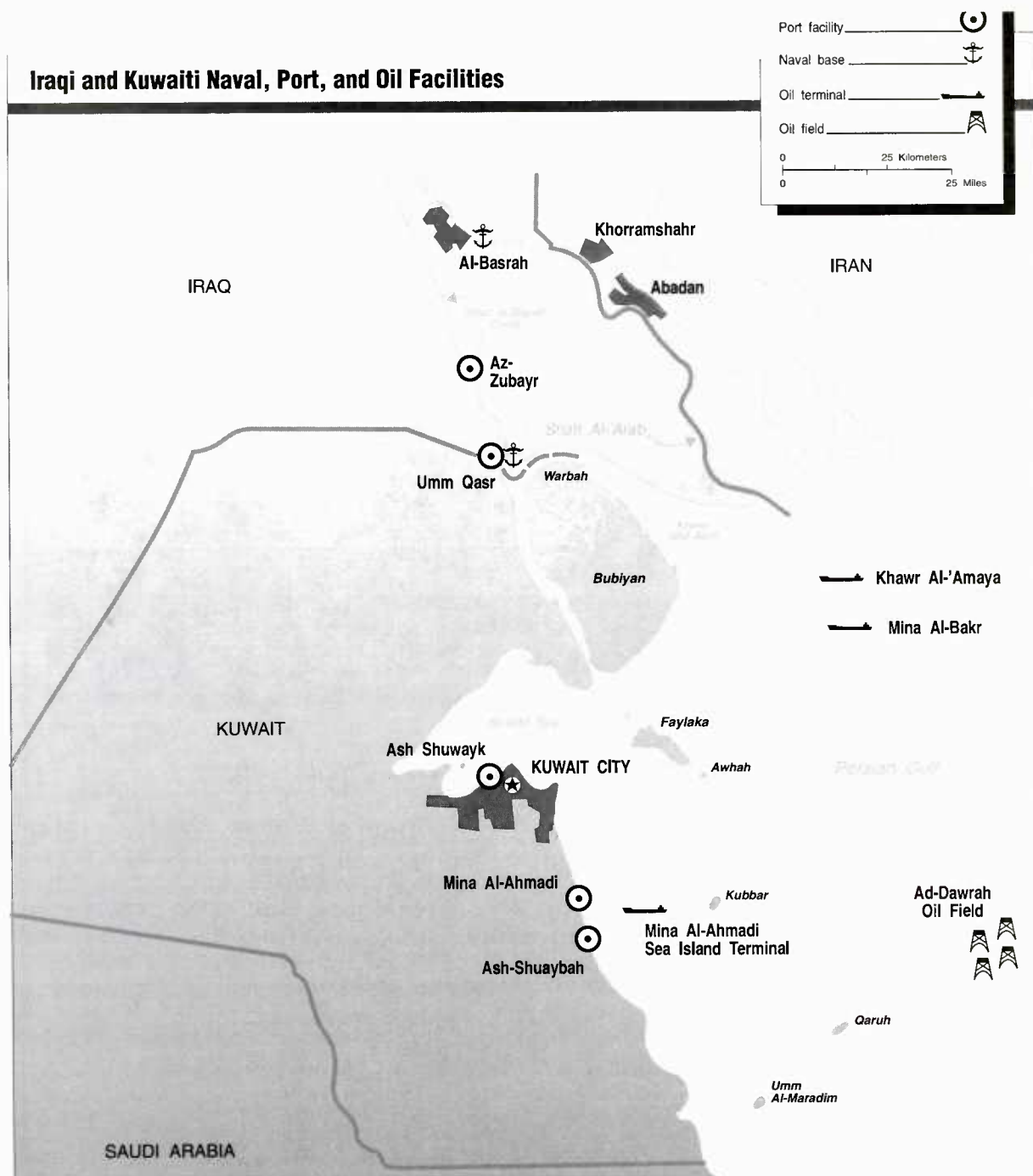


Figure VII-6

During the Iran-Iraq War, Iraqi F-1s conducted successful long range attacks against southern Persian Gulf shipping. In the Persian Gulf conflict, the principal Iraqi naval strength was its ability to conduct small scale, small boat operations, including missile attacks, mine warfare, and terrorist attacks against shipping in the northern Persian Gulf. The 13 Iraqi missile boats posed another lethal threat to Coalition naval forces and shipping. Iraq's missile boat inventory consisted of seven ex-Soviet *Osa* missile boats carrying Styx missiles (maximum range of 42 miles), five captured Kuwaiti TNC-45 and one FPB-57 missile boats carrying Exocet missiles (maximum range of 96 miles). This ASUW capability was used successfully during the Iran-Iraq War against at least one Iranian combatant and several merchant ships in the northern Persian Gulf. The rest of the approximately 165 Iraqi naval vessels were mostly small patrol boats, supplemented by minelaying boats and other specialized craft, such as hovercraft, *Polnocny* class amphibious tank landing ships, and auxiliary ships. The Iraqi Navy also operated one frigate, but this vessel historically had been used as a training ship and was not assessed as a serious threat.

To minimize casualties, destruction of the Iraqi surface threat was considered a prerequisite for moving the carrier battle force in the Gulf farther north to bring naval air power closer to targets and to prepare for amphibious operations. Iraqi surface threats also had to be eliminated to allow US and United Kingdom (UK) minesweepers and minehunting ships unimpeded access into enemy waters to clear lanes through the Iraqi minefields for amphibious operations or for NGFS. Other high-priority ASUW targets included land-based Silkworm antiship cruise missile batteries (using an active seeker with a 68-mile range), surface-to-air missiles (SAM), and aircraft capable of launching air-to-surface missiles. At the beginning of the conflict, Iraq had approximately 50 Silkworm missiles and seven launchers.

ASUW Command and Control

The battle force ASUW commander was tasked with neutralizing Iraqi naval forces in the northern Persian Gulf, as well as defending Coalition forces in the Persian Gulf and the GCC states' coastlines. Ensuring adequate surveillance for offensive ASUW, fleet defense, and coastal defense operations was a crucial concern of the Persian Gulf battle force ASUW commander. Continuous coverage of the surface vessel traffic in the entire Gulf was required and 24-mile exclusion zones for Iraqi combatants were established around each carrier and combat logistics force operating area.

At first, ASUW operations were directed by Commander, Destroyer Squadron (COMDESRON) 15 aboard *USS Midway*. In accordance with the maritime campaign plan, the ASUW commander set out the following objectives:

- Maintain accurate surface surveillance in the Persian Gulf;
- Establish sea control;

- Support MIO; and
- Conduct offensive ASUW operations.

The ASUW commander appointed several subordinate ASUW commanders to control specific operating areas and carry out these objectives. In the northern Persian Gulf, ASUW operations were directed by COMDESRON 35 embarked in *USS Leftwich* (DD 984), while the Commanding Officer of *USS Wisconsin* (BB 64) controlled the south/central Persian Gulf operating areas. A Canadian naval commander was assigned as the subordinate ASUW commander for the underway replenishment area and was responsible for protecting Coalition combat logistics ships.

After *USS Ranger's* arrival in the Persian Gulf on 15 January, responsibility for ASUW in the Persian Gulf shifted on 21 January to COMCARGRU 7, embarked in *USS Ranger*. COMCARGRU 7 adopted a more aggressive plan to eliminate the Iraqi naval threat as quickly as possible. To reflect this new offensive ASUW strategy, the ASUW objectives were changed to:

- Destroy all Iraqi surface combatants and minelayers;
- Deny Iraq the use of oil platforms for military purposes;
- Move back Iraqi surface forces in the northern Persian Gulf from south to north; and
- Prevent attacks or threats against Coalition forces and countries in the Gulf.

This plan called for using armed surface reconnaissance aircraft (ASR), helicopters and naval gunfire to achieve these goals.

COMCARGRU 7 continued to use local ASUW commanders, but modified the command structure and operating areas. COMDESRON 7, embarked in *USS P. F. Foster* (DD 964), became the northern Persian Gulf local ASUW commander and was primarily responsible for conducting offensive operations against Iraqi naval forces. The Commanding Officer of *USS Ranger* was the south/central Persian Gulf local ASUW commander and was tasked to provide fleet defense of the Coalition naval forces. The Canadian naval force commander remained in control of the underway replenishment area.

Coalition ASUW Capabilities

Assets used in ASUW operations included carrier-based aircraft (A-6E, F/A-18, F-14, and S-3A/B), maritime patrol aircraft (P-3C and British Nimrod), ground-based

Coalition combat air patrol (CAP) aircraft (e.g., Canadian CF-18), helicopters (Navy SH-60B, British Lynx, and Army OH-58D), and Coalition surface combatants. The following section briefly describes these ASUW assets. Some assets, such as MPA and helicopters, were under the ASUW commander's control. Other assets, such as strike, fighter, and E-2C airborne early warning (AEW) aircraft, also were used by other warfare commanders, who coordinated the use of these limited resources.

To increase the emphasis of offensive ASUW, the Persian Gulf battle force ASUW commander began ASR and armed scout missions on 21 January. Carrier-based A-6 and F/A-18 aircraft were used in ASR missions to search for and engage Iraqi surface vessels. However, since A-6s and F/A-18s also were the primary Navy strike aircraft used in the air campaign, ASR sorties were limited. S-3 aircraft conducted armed scout missions in the central Gulf and provided surveillance when maritime patrol aircraft were unable to support ASUW operations. S-3 aircraft actually engaged Iraqi naval forces twice during Operation Desert Storm and destroyed one enemy patrol boat. F-14 aircraft were not specifically launched for ASUW missions, but occasionally supported ASUW engagements when not engaged during CAP missions.

Surface surveillance in the northern Gulf was maintained by maritime patrol aircraft (MPA) – US P-3C from Masirah, and UK Nimrod aircraft from Seeb. These aircraft patrolled specified search areas near the aircraft carriers and surface ships. P-3C and Nimrod aircraft, which normally have a primary ASW mission, provided over-the-horizon (OTH) detection of targets. The aircraft then were able to prioritize surface contacts so Coalition aircraft could evaluate them efficiently. MPA also directed ASR aircraft to targets, and provided battle damage assessments (BDA). About 66 percent of all ASUW engagements were supported by MPA, primarily in the open Gulf south of Bubiyan Island. Engagements north of Bubiyan Island usually were initiated by ASR aircraft against targets of opportunity.

The ASUW commander also used ground-based Coalition aircraft, such as Canadian CF-18s, assigned to CAP duties over the Persian Gulf, to engage Iraqi naval vessels. Their use depended on AAW mission priorities, aircraft availability, and whether the CAP was within range of Iraqi surface combatants.

Helicopters were used extensively for ASUW operations. The battle force ASUW commander normally had two to five British Lynx, 10 to 23 SH-60Bs, and four OH-58Ds available for ASUW operations. The primary ASUW missions for the helicopters operating in the northern Persian Gulf were mine surveillance, surface surveillance and tracking, oil slick reconnaissance, and offensive ASUW engagements.

Mine surveillance was a primary helicopter mission until 23 January. Visual surveillance was conducted over Coalition ship operating areas. Between 24 January and 4 February, the primary mission of northern Gulf helicopters shifted to surface search, surveillance, and tracking of Iraqi naval combatants. The helicopters were instructed to find and interdict Iraqi patrol boats and minelayers, search oil

platforms for evidence of Iraqi military activity, and conduct quick reaction engagements against Iraqi surface vessels.

Coalition helicopters operating in the northern Persian Gulf participated extensively in offensive ASUW engagements. These offensive operations most commonly used a tactic which took advantage of the SH-60B's superior electronic surveillance measures and radar capability and the British Lynx's radar-guided missile capability. The OH-58Ds were used primarily against armed oil platforms and land targets.

Oil slick reconnaissance (i.e., monitoring the spread of oil spills caused by Iraq's environmental terrorism) became the highest priority for northern Gulf helicopters beginning 5 February. Helicopters were required to record on videotape the affected oil terminals and the extent of sea contamination. This mission was conducted to help contain the spreading oil slick, to report on the oil flow situation, and to document Iraq's use of oil as an act of environmental terrorism.

In addition to the US and the GCC states' navies, surface combatants from Argentina, Australia, Canada, Denmark, France, Italy, the Netherlands, Norway, Spain, and the United Kingdom (UK) participated in ASUW operations. Only US, UK, Kuwaiti, and Saudi surface combatants were involved in offensive ASUW operations against the Iraqi Navy. The GCC navies patrolled their coastal waters and defended Coalition facilities near shore against possible surprise attacks by Iraqi special forces operating from small boats. Other Coalition surface combatants provided fleet defense and protected the aircraft carriers and combat logistics forces. For example, France placed one frigate under US operational control on 15 February to carry out escort missions for the Coalition's combat logistics ships; however it was not authorized to engage in offensive operations.

Destruction of the Iraqi Navy

The first ASUW strike occurred on 18 January when strike aircraft from *USS Ranger* and *USS Midway* engaged and damaged two Iraqi gunboats, including an unconfirmed TNC-45 class missile boat, as well as a *Sawahil* class service craft supporting Iraqi forces operating from oil platforms.

Also on 18 January, several strike aircraft flying over the northern Gulf reported taking fire from Iraqi forces on oil platforms in the Ad-Dawrah offshore oil field, about 40 miles off of the Kuwaiti coast. The field's 11 oil rigs were along approach and departure routes used by Coalition aircraft to strike targets in Iraq. Nine platforms were believed to be occupied by Iraqi troops, who also were using them to spy on Coalition ship and aircraft movements. *USS Nicholas* (FFG 47) and embarked OH-58Ds, scouted the oil field and identified targets. That night, within range of Iraqi Silkworm missiles and near Iraqi combatant ships and aircraft armed with Exocet antiship missiles, *USS Nicholas* and the Kuwaiti fast attack craft *Istiqlal*

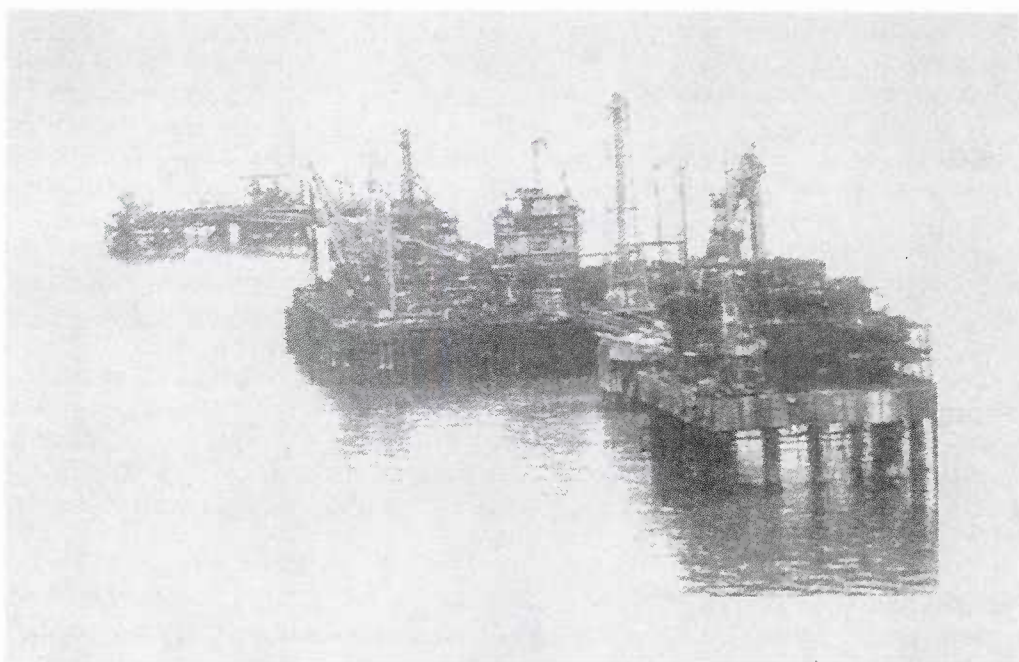


Figure VII-7
Ad-Dawrah Oil Platforms

(P5702) conducted the first surface engagement of the war. Masked by darkness and emitting no electronic transmissions, *USS Nicholas* approached the platforms from the south. Over the horizon, the helicopter pilots, wearing night-vision devices, readied air-to-surface missiles. Flying low, the OH-58Ds, along with a Royal Navy Lynx helicopter and *USS Nicholas*' SH-60B, reached the targets – two platforms believed to be heavily armed and out of range of *USS Nicholas*' 76-mm gun. The OH-58D and Lynx helicopters attacked the platform with guided missiles. As an ammunition stockpile on the platform exploded, six Iraqi soldiers attempted to escape by using a Zodiac rubber boat. *Istiqlal* later captured them.

Soon after the helicopter attack, *USS Nicholas* and *Istiqlal* shelled nine of the 11 armed platforms to destroy remaining fortifications. The Coalition forces then picked up 23 Iraqis and landed a SEAL platoon on the platforms. Upon inspection, caches of shoulder-fired SAMs and a long range radio were discovered. The operation successfully removed a SAM threat to Coalition air forces, destroyed Iraqi surveillance posts, and captured the first enemy prisoners of war (EPWs) in Operation Desert Storm.

In an attempt to isolate Iraqi naval combatants in the northern Persian Gulf from the port facilities and naval bases at Al-Basrah, Az-Zubayr, and Umm Qasr (and to prevent more Iraqi vessels from leaving these bases), a mining operation was conducted 18 January at the mouth of the Khawr Az-Zubayr river. The entrance to this river is on the Iraqi-Kuwaiti border northwest of Bubiyan Island. Iraqi naval

vessels which used this waterway were mostly fast patrol boats similar in size to a Soviet Osa class patrol boat. The mission involved 18 aircraft from *USS Ranger*, including four A-6s carrying Mark 36 Destructor mines. Forty-two of the 48 mines were successfully dropped on four separate locations. Six mines on one aircraft failed to release and the aircraft diverted to Shaikh Isa, Bahrain, to download the ordnance before returning to *USS Ranger*. One A-6 was shot down during the mission. Because no BDA was available, it was not possible to determine the effectiveness of the mining.

On the night of 22 January, a P-3C detected and tracked an Iraqi tanker carrying a hovercraft. The Iraqi merchant vessel had been conducting electronic warfare operations and was thought to be supporting small boats operating in the area. It also was suspected of carrying refined fuel, which could be used to ignite a crude oil spill. A-6s from *USS Midway* attacked the tanker as the hovercraft launched from the ship and took cover near the Mina Al-Bakr oil terminal. An A-6 then flushed the hovercraft away from the oil terminal and sank it with Rockeye cluster bombs.

After these initial actions in the northern Gulf and the capture of the Ad-Dawrah oil platforms, the pace of ASUW operations accelerated. On 24 January, A-6s from *USS Theodore R. Roosevelt* destroyed an Iraqi minelayer and another patrol boat. Also on 24 January, the Saudi Arabian patrol boat *Faisal* (517) launched a Harpoon surface-to-surface missile against a reported Iraqi utility craft with unknown results. Near Qaruh Island, a second enemy minelayer, attempting to evade an A-6E, sank after hitting one of its own mines.

Around noon on 24 January, OH-58Ds operating from *USS Curts* (FFG 38) attempted to rescue 22 Iraqis from the minelayer sunk near Qaruh Island. As the helicopters assisted the survivors, Iraqi forces on the island fired on the helicopters. The helicopters returned fire, and *USS Curts* maneuvered closer to the island and attacked the positions with 76-mm guns, beginning a six-hour operation to retake the first parcel of Kuwaiti territory. SEALs from Naval Special Warfare Group 1 landed on Qaruh aboard helicopters from *USS Leftwich*. With *USS Nicholas* and *USS Curts* covering the island, the SEALs reclaimed the island and raised the Kuwaiti flag. The Coalition forces captured 67 EPWs during the battle and obtained intelligence about Iraqi minefields in the area.

*"The high point for me was when I saw
the Kuwaiti flag flying over its own territory."*

Commanding Officer, *USS Curts*

Although several Iraqi vessels were engaged before 24 January, the missile boats remained operational. As early as 27 January, the ASUW commander

expressed concern that Iraqi naval forces might seek safe haven in Iran, just as the Iraqi air force had attempted. Surveillance regions for maritime patrol aircraft, helicopters, and ships were established to intercept fleeing ships. Coalition ships and aircraft were positioned along the northwest Persian Gulf coast to detect Iraqi vessels leaving ports in Kuwait and Iraq. A barrier of ships and aircraft also was set up along the eastern coast of the Persian Gulf to intercept any Iraqi missile boats moving along the coastline under cover of merchant shipping.



*Figure VII-8
USS Leftwich Crew Members Survey
Iraqi Weapons Captured by
Coalition Forces on Qaruh Island*

On 29 January, Royal Air Force Jaguars detected 15 Iraqi fast patrol boats attempting to move from Ras Al-Qul'ayah to Mina Al-Saud as part of an apparent combined operation to attack the port of Ras Al-Khafji. Lynx helicopters from *HMS Gloucester* (D 96), *Cardiff* (D 108), and *Brazen* (F 91) located and engaged the Iraqi

boats with Sea Skua missiles, leaving two sunk or damaged, and scattered the rest of the flotilla. Coalition aircraft then sank or severely damaged 10 more of the 15 small boats.

Battle of Bubiyan: Iraqi Patrol Boat Strikes

On the night of 29 January, a moonless night with restricted visibility caused by weather and oil fires, an A-6E on an armed surface reconnaissance mission located four suspicious vessels south of Al-Faw Peninsula. With their lights out, the vessels were headed toward Iranian coastal waters. The antisurface warfare commander assigned tactical control of the A-6 to an E-2C, which was in the area on an early warning mission. The vessels were identified as patrol boats, but their nationality could not be determined immediately. Several navies operated small boats in the northern Gulf so suspected enemy vessels had to be identified positively before they could be engaged. Time was crucial to prevent Iraqi vessels from escaping to Iran, but fire from friendly forces, or an international incident involving Iran, had to be prevented.

Using available intelligence, the E-2C positively identified the vessels as hostile and authorized the A-6 to attack. The A-6 dropped a 500-lb laser-guided bomb (LGB) and guided it to a direct hit on the leading vessel. The other Iraqi boats scattered, but the A-6 continued to attack, dropping another bomb on a second boat. The second direct hit destroyed the superstructure and caused the boat to go dead in the water. Meanwhile the E-2C located an F/A-18 to assist in the attack and directed it to the targets. The A-6E teamed with the F/A-18 to guide a 500-lb LGB dropped by the F/A-18 to a direct hit on the third boat. By this time both aircraft had expended their ordnance and the fourth Iraqi patrol boat continued its escape to Iran.

The E-2C contacted fighter control which released two Canadian CF-18 on CAP that had just completed refueling from a tanker. The E-2C assumed tactical control of the Canadian aircraft and directed them to the last gunboat. Since the CF-18s were configured for a combat air patrol mission, they did not have any bombs, but attacked the Iraqi gunboat with strafing runs using 20-mm guns. Three Iraqi patrol boats were found capsized (a FPB-53, FPB-70, and a TNC-45). The fourth Iraqi vessel, an Osa patrol boat, later was located in an Iranian port with substantial strafing damage to its superstructure.

The next day, a large force of Iraqi combatants based at Az-Zubayr and Umm Qasr attempted to flee to Iran, but was detected and engaged by Coalition forces near Bubiyan Island in what was later called "the Battle of Bubiyan." This battle lasted 13 hours and ended with the destruction of the Iraqi Navy. With P-3Cs providing target locations, helicopters, ASR aircraft on alert, and other aircraft diverted from strike and CAP missions conducted 21 engagements against Iraqi

surface combatants. By the end of the Battle of Bubiyan, one FPB-57 missile boat and two TNC-45 missile boats were heavily damaged. An additional three *Osa* missile boats and possibly a third TNC-45 were damaged. Three *Polnocny* amphibious ships were damaged, two of them heavily, along with one T-43 minesweeper. Only two damaged ships, an *Osa* II missile boat and a *Polnocny* amphibious ship escaped to Iranian waters.

On 31 January, Coalition helicopters captured 20 EPWs on the Mina Al-Bakr oil platform after the Iraqis fled a sinking Iraqi *Polnocny* class amphibious ship, which had been laying mines when Coalition aircraft attacked. During that operation, a Lynx helicopter severely damaged an Iraqi TNC-45 combatant attempting to prevent the capture.

"With the burning Polnocny combatant only a mile away, the EPWs were searched and hoisted aboard the helos. Each helo picked up 10 EPWs with the mission completed well after dark."

Pilot, HS-12, CVW-5, USS Midway

The Battle of Bubiyan and further air strikes against Iraqi port facilities essentially eliminated the Iraqi surface threat to Coalition shipping in the Gulf. By 2 February, all 13 Iraqi surface craft capable of delivering antiship missiles had been destroyed or disabled, and the Iraqi naval force was considered combat ineffective. NAVCENT declared Coalition sea control of the northern Persian Gulf on 8 February. Thereafter, the remaining Iraqi naval units conducted only minor, isolated operations at sea, and these vessels were engaged by Coalition aircraft. For example, after 8 February, five Iraqi vessels were engaged by Royal Navy Lynx helicopters.

On 16 February, an SH-60B helicopter from *USS P. F. Foster* located an Iraqi patrol boat operating with an Iraqi merchant ship and directed the Kuwaiti patrol boat *Istiqlal* to the target. *Istiqlal* fired an Exocet missile and its 76-mm gun against the patrol boat, causing an explosion and unknown damage.

ASUW forces also attacked land-based Silkworm antiship missile sites, which threatened Coalition naval forces. On 18 February, *USS Jarrett's* (FFG 33) SH-60B directed two OH-58Ds to a suspected Silkworm missile site on Faylaka Island. The OH-58Ds fired Hellfire missiles and reportedly destroyed a launcher.

On 20 February, the crew of a Navy S-3 aircraft from *USS T. R. Roosevelt*, but under the tactical control of *USS Valley Forge* (CG 50) engaged and destroyed an Iraqi gunboat with three 500-lb bombs, becoming the first S-3 crew to sink a hostile surface vessel in combat.

"We could identify the speed boat between Bubiyan Island and Iran. As the two Mk 82 500-lb bombs came off the aircraft, I quickly broke left and pumped out several flares in our defense. We realized that we had become the first Viking crew to sink a surface boat in combat."

Pilot, VS-24, CVW-8, USS Theodore Roosevelt

By using an offensive ASUW concept, Coalition naval forces found and destroyed Iraqi naval vessels well beyond the range of enemy antiship missiles. Carrier-based aircraft attacked and damaged many Iraqi ships while they were still alongside piers in Iraqi naval bases and port facilities. This ASUW strategy resulted in the destruction of, or damage to 143 Iraqi naval vessels. ASUW operations also extended beyond the destruction of naval vessels, attacking other threats to Coalition naval forces such as armed oil platforms and Silkworm antiship missile sites along the Kuwaiti and Iraqi coastlines.

Antisurface Warfare Results

- 143 Iraqi Naval Vessels Destroyed/Damaged
 - 11 Antiship Missile Boats Destroyed
 - 2 Antiship Missile Boats Disabled
 - 3 *Polnocny* Class Amphibious Ships Destroyed
 - 1 *Ibn Khaldun* Frigate Destroyed
 - 1 Bogomol PCF Patrol Boat Destroyed
 - 116 Small Patrol Boats and Auxiliaries Destroyed/Damaged
 - 9 Minelayers Destroyed
- All Iraqi Naval Bases/Ports Significantly Damaged
- All Northern Persian Gulf Oil Platforms Searched and Secured
- No Attacks by Iraqi Surface Vessels Against Coalition Forces

Figure VII-9

ANTI-AIR WARFARE (AAW)



Figure VII-10

The Navy's F-14 Fighter Was Used Extensively for Offensive and Defensive Counterair Missions during Operation Desert Storm

The limited reaction times caused by the relatively short distances between Iraqi airfields and Coalition naval forces made it necessary to rely primarily on airborne, forward-positioned CAPs instead of deck-launched or ground-launched interceptors. Although both the Red Sea battle force and Persian Gulf battle force conducted AAW operations during Operation Desert Storm, this discussion focuses primarily on Persian Gulf operations. The relatively constrained Persian Gulf airspace resulted in using CAP aircraft in small, fixed operating areas. This geographical limit and the requirement for positive target identification before engagement prevented the use of standard fleet air defense tactics, including long-range indication and warning, layered air and SAM defenses, and beyond-visual-range engagements. Instead, fixed CAP stations were established in the central and northern Persian Gulf; these stations were manned 24 hours a day and were designed to respond quickly to an Iraqi air raid.

The Iraqi Threat

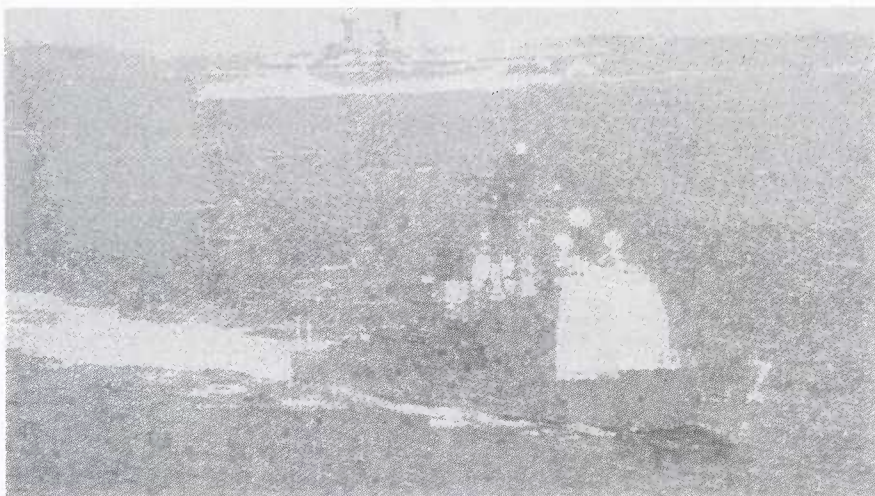
The Coalition's AAW operations in the Red Sea and Persian Gulf were influenced by the Iraqi antiship capabilities. During the Iran-Iraq War, Iraqi aircraft had used coordinated long-range antiship missile attacks with in-flight refueling. Furthermore, during Operation Desert Shield, Iraq practiced its antiship tactics in several large-scale exercises over Iraq and the northern Persian Gulf. Iraq had four types of airborne antiship-capable platforms. Each of the 32 strike-capable F-1 aircraft could fire two Exocet missiles. Iraq's four B-6D long-range bomber aircraft carried air-launched Silkworm missiles. However, these Chinese-made bombers were not deemed a significant threat because of their large size, slow speed, and ineffective navigation equipment. Iraq also had 25 Su-24s, capable of carrying the AS-7, 9, and 14 air-to-surface missiles, rockets, and laser-guided and general purpose bombs. The Su-24 also had the potential to use a sophisticated electronic countermeasure system. The French-built Super Frelon helicopter could launch two Exocet missiles and had been used by Iraq during the Iran-Iraq War in an antiship role before the F-1 was introduced.

AAW Command and Control

Since cruisers had trained and performed routinely in the role of Battle Force AAW commander, Aegis and New Threat Upgrade (NTU) cruisers were selected as AAW commanders in both the Red Sea and Persian Gulf. *USS Bunker Hill* (CG 52) and *USS Worden* (CG 18) alternated as AAW commander in the Persian Gulf. The AAW commander's primary mission was to establish and maintain air superiority over the Persian Gulf. To accomplish this mission, the following objectives were established:

- Maintain an extended air space surveillance over the Persian Gulf, Gulf of Oman, and northern Arabian Sea;
- Detect, identify, intercept, and engage or escort all hostile or unknown aircraft entering the Persian Gulf battle force AAW surveillance area;
- Provide AAW protection for Coalition forces operating in the battle force surveillance areas; and
- Establish air control and deconfliction procedures for Coalition air forces operating over the Persian Gulf.

Deconfliction involved distinguishing Coalition aircraft returning from missions over Iraq from hostile aircraft possibly attempting surprise attacks against Coalition forces or GCC states by trailing behind the returning Coalition aircraft.



*Figure VII-11
The Aegis Cruiser USS Bunker Hill Was the AAW Commander
in the Persian Gulf during Operation Desert Storm*

Day-to-day AAW command and control were concerned mostly with the tasks of air control and deconfliction. Air controllers kept track of hundreds of aircraft entering the Red Sea and the northern Persian Gulf every day, including transiting Coalition strike aircraft, CAP, airborne early warning (AEW) aircraft, tankers, ASUW aircraft, maritime patrol aircraft, helicopters, and special mission aircraft. Coalition forces in the Persian Gulf shared AAW information over a high frequency radio data link. This Persian Gulf data link was interfaced with a larger, theater-wide data link, which included airborne warning and control system (AWACS) aircraft and ground-based Coalition air defense sites.

"Bunker Hill's control of more than 65,000 combat sorties with zero blue-on-blue [friendly] engagements is a benchmark I doubt will ever be exceeded."

US Naval Surface Group Western Pacific Commander

US naval forces took primary responsibility for deconfliction and target identification over the northern Persian Gulf, as well as the Red Sea. During the Persian Gulf Crisis, *USS Worden* used the NTU combat system successfully to deconflict more than 15,000 Coalition aircraft returning from missions, control 17 different types of US aircraft, and control the CAP of six Coalition nations. Designated return corridors and flight profiles proved the key methods to separate friendly aircraft from potentially hostile ones. These deconfliction methods required

returning Coalition aircraft to fly within specific altitude bands and speeds along designated return corridors.

Coalition AAW Capabilities

AAW detection requirements in the Persian Gulf were particularly complex and demanding. Substantial numbers of ships were dedicated partially or totally to AAW responsibilities. For example, on 15 February, excluding the four aircraft carriers operating in the Gulf, 21 surface combatants, including six Aegis and three NTU cruisers and 12 US, UK, Australian, Spanish, and Italian destroyers and frigates, were under the AAW commander's control for AAW defense of Coalition naval forces. In addition to providing complete AAW surveillance, radar picket ships controlled hundreds of aircraft and helicopters in multiple warfare missions. For example, during the amphibious exercise Imminent Thunder, *USS Bunker Hill's* Aegis combat system, operated by well-trained shipboard air controllers, safely controlled more than 40 aircraft operating simultaneously in the amphibious objective area. AAW ships also controlled Coalition CAP aircraft over the Persian Gulf and Red Sea.

The E-2C, an all-weather, carrier-based AEW and command and control aircraft, provided AEW coverage, some CAP control, and relayed communications for CVBGs in the northern and central Persian Gulf. At least one E-2C was kept airborne continuously during Operations Desert Shield and Desert Storm.

Of the approximately 18,120 sorties flown by carrier-based aircraft during Operation Desert Storm, about 21 percent were devoted to defensive counterair missions. Of these, 67 percent were flown by F-14s and 33 percent were flown by F/A-18s. Canadian CF-18 squadrons played an important role by manning one of the northern Persian Gulf CAP stations continuously from early October until the start of the war and then supplementing those stations through the end of hostilities.

Despite some degradation in performance because of weather and near-land operations, the complementary capabilities of the air search radars in NTU and Aegis cruisers, and the E-2 AEW aircraft provided complete coverage of air contacts in the Persian Gulf. (Since the E-2C was designed for open ocean operations, the aircraft's radar system experienced expected reductions in detection because of land clutter and weather effects. This limitation required the extensive use of surface platforms to ensure optimum airspace radar surveillance.)

Significant Persian Gulf AAW Operations

The only attempted airborne attack mounted by Iraqi aircraft against the Coalition occurred on 24 January. Two Iraqi F-1s, on a mission against the oil

production facility and port in Ad-Dammam, Saudi Arabia, departed Iraqi airspace flying just to seaward of the Kuwaiti coastline, the boundary between the USAF AWACS and fleet air defense responsibilities. The AWACS aircraft directed four Saudi F-15s toward the incoming Iraqi F-1s and a Saudi pilot successfully shot down the two F-1s, thus thwarting the Iraqi attack before missiles were launched (see Appendix I for more detail).

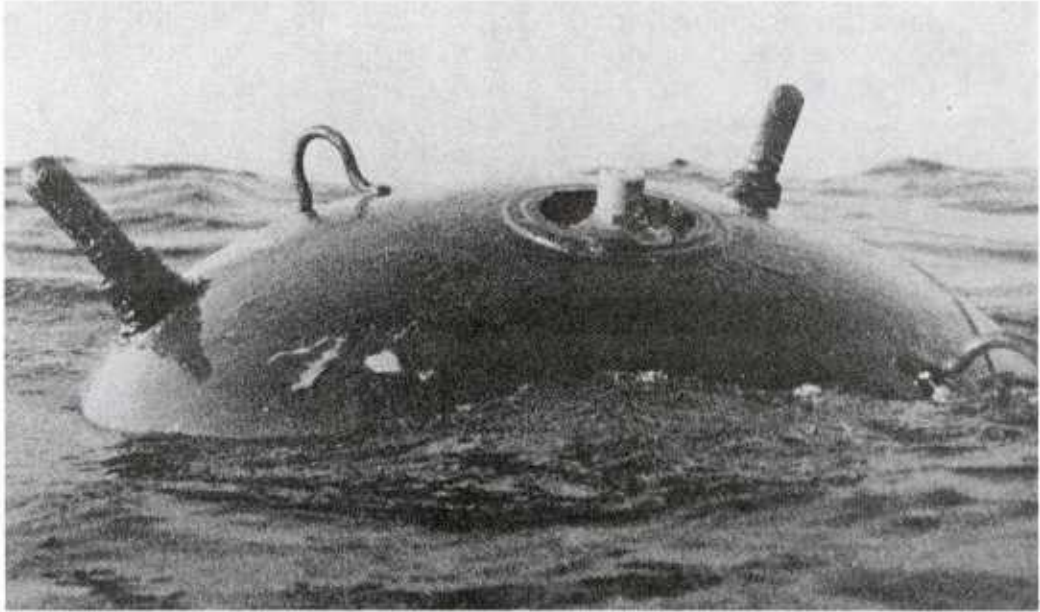
Only one actual anti-air engagement against Iraqi missiles occurred during the hostilities. On 24 February, *USS Missouri* (BB 63), escorted by *USS Jarrett* and *HMS Gloucester*, approached within 10 miles of the Kuwaiti coast to provide naval gunfire support (NGFS) to advancing Coalition troops. As the battleship fired 16-inch guns in the early morning of 25 February, 10 USMC helicopters from *USS Okinawa* (LPH 3), along with the amphibious landing ship *USS Portland* (LSD 37), conducted a night heliborne amphibious feint near the Kuwaiti port of Ash Shuaybah.

Iraqis manning the Kuwait Silkworm missile sites reacted to the amphibious feint by firing two antiship missiles towards the *USS Missouri* and her escorts. The first missile landed between *USS Missouri* and *USS Jarrett*, possibly deceived by chaff fired by the two ships. The second missile was detected on radar by *HMS Gloucester* leaving the coastline 21 miles to the west and heading for *USS Missouri*. *HMS Gloucester's* crew identified the contact as a Silkworm missile, evaluated it as a direct threat to Coalition warships, and fired two Sea Dart surface-to-air missiles, which destroyed it.

The Silkworm activity then was reported to an E-2C, which assumed responsibility for coordinating an attack on the missile site. Using several intelligence assets, including an EP-3, the site was located and strike aircraft were directed to the target. An A-6E, evading heavy SAM and antiaircraft artillery activity near its target, dropped 12 Rockeye cluster bombs. Initial BDA reported heavy smoke from the target and all indications of Silkworm activity ceased. Later, reconnaissance confirmed the missile site's destruction.

COUNTERMINE WARFARE

The five months of Operation Desert Shield permitted Iraq to develop an extensive coastal defense system in Kuwait. The Iraqi mine threat affected almost all naval operations during the Persian Gulf Conflict. After Operation Desert Storm began, the principal mission of Coalition MCM assets was to clear a path to the Kuwaiti coast for NGFS and a possible amphibious landing.



*Figure VII-12
A Drifting Iraqi Contact Mine in the Persian Gulf*

The Iraqi Threat

The bulk of Iraq's mine inventory consisted of Iraqi reproductions of pre-World War I designed Russian contact mines. However, it also included high-technology magnetic and acoustic influence mines purchased from the Soviet Union and Italy. Specifically, Iraq had 11 types of mines including moored contact mines (e.g., the Myam, the Soviet M-08, and a similar Iraqi-produced LUGM-145) and bottom acoustic influence mines (e.g., the Italian Manta acoustic/magnetic mine, the Soviet KMD magnetic influence mine, the Soviet UDM acoustic influence mine, and the Iraqi-produced Sigeel acoustic influence mine). Before Operations Desert Shield and Desert Storm, Iraq was estimated to have 1,000 to 2,000 mines. After the cease fire, Iraq reported it had laid 1,167 mines during the conflict (Figure VII-13).

Iraq could deliver mines from surface and air platforms. Sea-based mine delivery platforms ranged from mine rail-equipped minesweepers to landing craft, auxiliaries, and even small boats. As Iran had demonstrated during the Iran-Iraq War, practically any surface vessel could become a minelayer. Iraq's Super Frelon helicopter was assessed as its principal airborne minelaying asset. Other possible air delivery platforms included Hip helicopters and B-6 bombers.

Actual Iraqi Mine Fields

Mine lines and mine fields
from Iraqi disclosure of 3 March

0 25 Kilometers
0 25 Miles

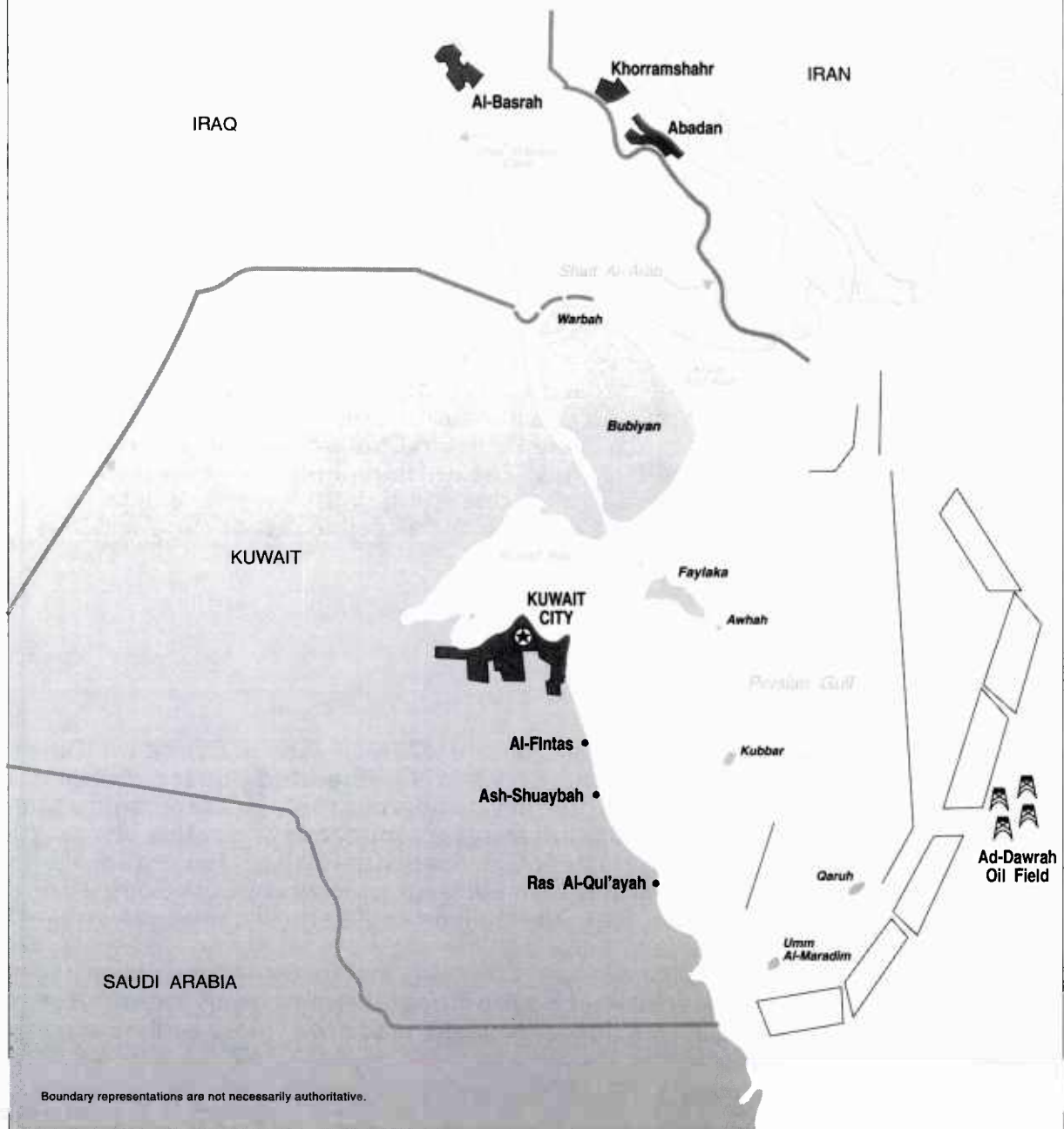


Figure VII-13

Iraq's minelaying strategy seemed to focus on protecting its seaward flank from an amphibious assault. Iraq apparently started laying mines in the northern Persian Gulf in late November. The Iraqis used two principal methods of offshore mining operations. They laid fields of moored and bottom mines and single mine lines to protect logistics sea lines of communication and the Kuwaiti coast from amphibious assault. In addition, it appears the Iraqis deliberately may have set some mines adrift in the Persian Gulf, perhaps so the mines would drift in the southern currents and damage Coalition ships, or at least disrupt Coalition naval operations. The first drifting mine was discovered by Royal Saudi MCM forces in the Zuluf oil field on 21 December. Although it is possible some floating mines accidentally broke free from their moorings, there is evidence (e.g., no mooring chains and little marine growth or corrosion) that approximately 20 percent of the floating mines recovered and destroyed by Coalition MCM forces were set adrift intentionally.

Intelligence reports during the war indicated the Iraqis used small rubber boats, each carrying a maximum of four mines, to deploy the drifting mines. These small boats operated from Ras Al-Qul'ayah and probably set 20 mines adrift intentionally. After the Coalition's success in neutralizing the Iraqi Air Force, the drifting mines were viewed as the primary threat to Coalition naval vessels operating in the Gulf beyond antiship missile ranges. The drifting mine threat was a considerable concern to the aircraft carriers operating in the Gulf. The high-speed nature of the carrier flight operations reduced the effectiveness of mine watches and helicopter searches.

MCM Command and Control

NAVCENT established a US MCM Group (USMCMG) early in Operation Desert Shield to respond to the Iraqi mine threat. This group operated under Commander Middle East Force's (CMEF) control. The staff assigned to the USMCMG commander were both active-duty personnel from other naval commands and reservists. A British MCM force joined with the USMCMG to conduct most MCM operations during Operation Desert Storm. This British MCM group was under the operational control of the UK's Senior Naval Officer Middle East, but tactical control was given to the USMCMG commander.

MCM planning initially focused on supporting an amphibious assault north of Ash Shuaybah on the Kuwaiti coastline. CINCCENT made the final decision in early February to cancel this amphibious assault and directed NAVCENT to concentrate on an amphibious raid on Faylaka Island. MCM planning then shifted toward the new target. The mine clearance areas required for the Faylaka Island raid at first included a full set of fire support areas (FSA), a sea echelon area, and a cleared channel to the amphibious objective area. MCM objectives later were reduced to providing a safe path for *USS Missouri* to position herself off Faylaka Island to provide NGFS and present the Iraqis with credible indications of an amphibious landing.

Coalition MCM Capabilities

The US mine warfare concept was designed around a European war scenario which relied on North Atlantic Treaty Organization (NATO) allies to participate substantially in mine warfare operations, especially in MCM. The Navy's MCM capabilities in the Persian Gulf consisted of surface mine countermeasures (SMCM), aviation mine countermeasures (AMCM), and explosive ordnance disposal (EOD) teams. (Special Operations Forces also were used for MCM operations and are discussed in Appendix J.) SMCM capabilities included the newly commissioned *USS Avenger* (MCM 1) class MCM ship and three 30-year-old *USS Aggressive* and *USS Acme* (MSO 422 and 508) class minesweepers. The AMCM capability consisted of six MH-53E AMCM helicopters. More than 20 US EOD teams and a 23-man Australian team also were deployed to neutralize or destroy detected mines.

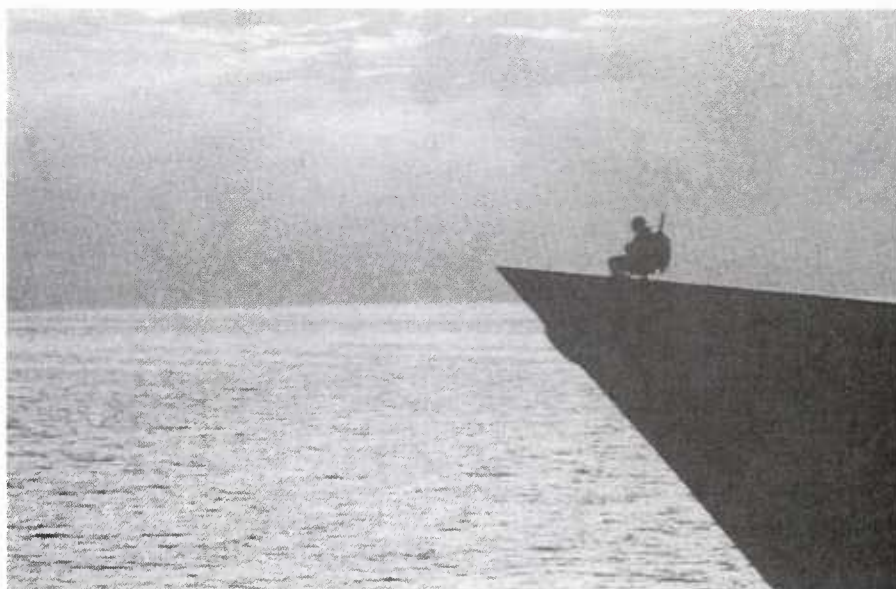


Figure VII-14
US Ships Primarily Relied on Mine Watches Stationed on the Bow to Locate and Warn of Mines

USS Avenger, the Navy's newest and most capable MCM ship, used the AN/SQQ-32 MCM sonar, a sophisticated mine-hunting sonar, to detect moored and bottom mines in shallow or deep waters. *USS Avenger* then used the AN/SLQ-48 mine neutralization system (MNS) to locate, examine, and destroy the detected mines. The MNS consists of a remotely piloted submersible vehicle equipped with sonar and two television cameras for locating mines, explosives for neutralizing mines, and cable cutters for cutting the mooring so the mine floats to the surface for

destruction. The other US minesweepers used the AN/SQQ-14 MCM sonar to detect bottom and moored mines and mechanical minesweeping gear to cut mine cables.



Figure VII-15

USS Avenger and USS Adroit Are Offloaded from the Dutch Heavy Lift Ship Super Servant III (its Superstructure Can Be Seen in the Background) after Arriving in the Persian Gulf

AMCM helicopters towed a cable with a mechanical cutting device through the water, to cut a mine's mooring cable and release the mine to the surface. EOD teams or gunfire then detonated the mine. The helicopters also used acoustic and magnetic MCM sleds, which simulate a ship's propellers and magnetic signature to detonate influence mines.

The minesweepers *USS Impervious* (MSO 449), *USS Adroit* (MSO 509), *USS Leader* (MSO 490), and the MCM ship *USS Avenger* arrived in the theater 30 September on the Dutch heavy-lift ship *Super Servant III*. *USS Adroit* and *USS Impervious* were Naval Reserve Force minesweepers, which deployed to the Gulf augmented by Reserve crews. On 7 October, the six MH-53E AMCM helicopters arrived by USAF C-5A airlift. *USS Tripoli* (LPH 10), which had been part of the amphibious task force, was assigned to the USMCMG as a support ship for the AMCM helicopters and as the USMCMG command ship. The USMC landing force disembarked and offloaded its equipment as the USMCMG staff embarked in *USS Tripoli* on 22 January. In addition, two UAE-flagged vessels, *Vivi* and *Celina*, were contracted as support ships for EOD teams that accompanied the USMCMG. These forces, along with the EOD teams, formed the USMCMG, based in Abu Dhabi, UAE.



Figure VII-16
**A Navy MH-53E AMCM Helicopter Conducts MCM Operations
 near a Royal Navy Hunt Class Mine Hunter in the Persian Gulf**



Figure VII-17
**Members of Helicopter Mine Countermeasures Squadron 14 (HM 14)
 Prepare a Mark 105 Hydrofoil Minesweeping Sled for MCM Operations**

In addition to the US MCM assets, two other NATO countries and Saudi Arabia provided SMCM ships during Operations Desert Shield and Desert Storm. The Royal Navy provided the most SMCM assets to the Coalition MCM effort. The UK initially deployed the *Hunt* Class mine hunters *HMS Atherstone* (M 38), *HMS Cattistock* (M31), and *HMS Hurworth* (M 39), along with the support ship *HMS Herald* (AGSH 138). Later, the mine hunters *HMS Ledbury* (M 30) and *HMS Dulverton* (M35) joined the MCM force. This UK MCM group operated closely with the USMCMG in clearing Iraqi mines in the northern Persian Gulf during Operation Desert Storm. Belgium contributed two *Tripartite* class mine hunters, *Iris* (M 920) and *Myosotis* (M 922), plus the support ship *Zinnia* (A 961). The Belgian MCM group operated mostly in the Gulf of Oman. Saudi Arabia's MCM ships included the minesweepers *Addriyah* (MSC 412), *Al Quysumah* (MSC 414), *Al -Wadi'ah* (MSC 416), and *Safwa* (MSC 418).

The SMCM and AMCM assets were responsible for clearing areas with water depths greater than 10 meters. The Coalition's MCM force provided the ability to survey the Persian Gulf open water areas, port approaches, harbors, potential amphibious objective areas, and sea lines of communication. The MCM force also had the ability to detect and counter all types of Iraqi bottom and moored mines.

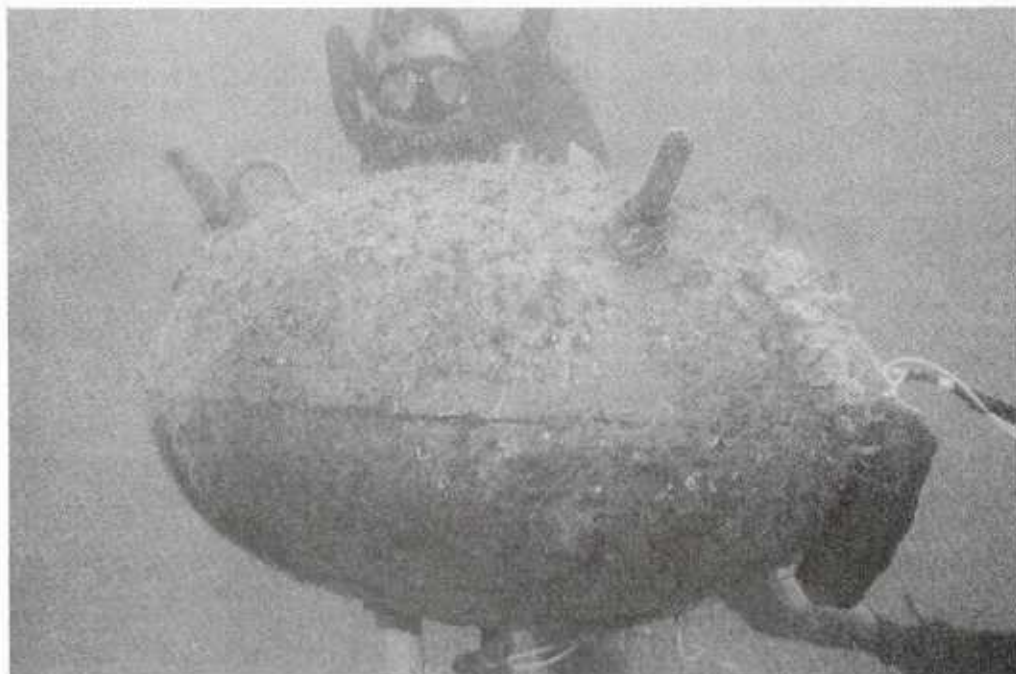
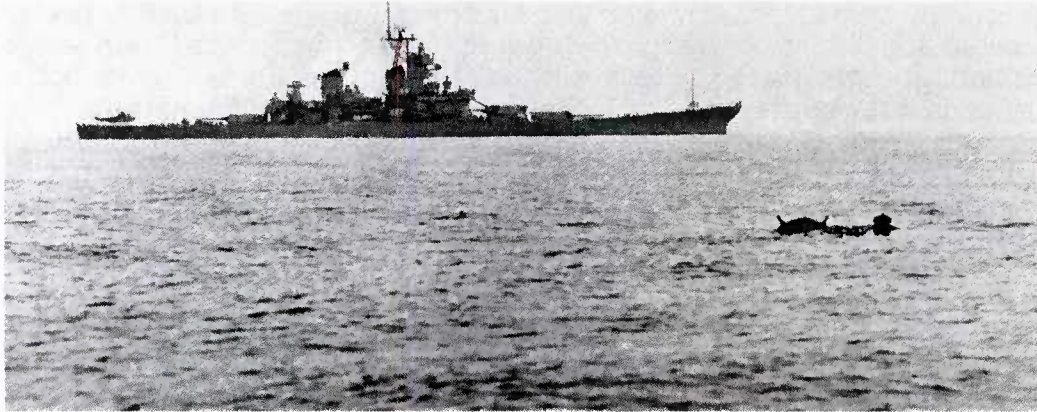
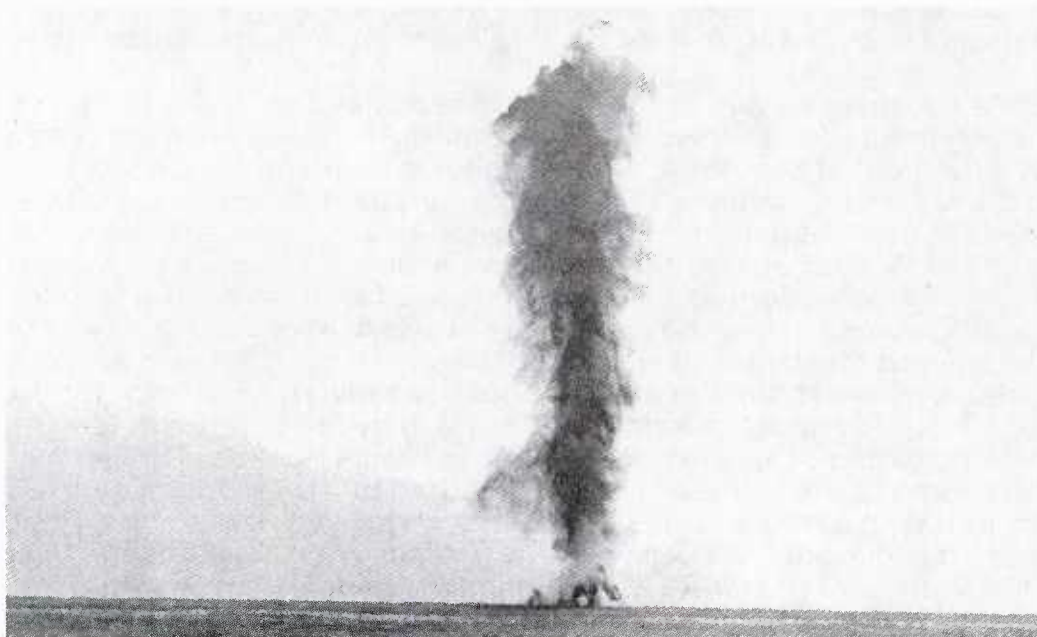


Figure VII-18
An EOD Specialist Prepares a Moored Mine for Destruction



*Figure VII-19
A Drifting Mine near USS Missouri before Detonation by EOD Specialists*



MCM Operations

Before the start of Operation Desert Storm, the US ability to gather intelligence on Iraqi minefield locations, or observe and counter Iraqi minelaying activity in international waters (considered a hostile act under international law), was degraded by restrictions on naval and air operations in the northern Persian Gulf. To avoid any possibility of provoking Iraqi military action before Coalition defensive and later offensive preparations were complete, CINCCENT restricted naval surface forces in the Gulf to operating south of the 27°30'N parallel (approximately 72 miles south of the Kuwaiti-Saudi border) until early January. Similar restrictions kept the flight paths of aircraft south of 27°45'N (approximately 55 miles south of the Kuwaiti-Saudi border) unless tactically required to exceed that limit. Those restrictions precluded gathering intelligence on Iraqi mining activity and also prevented NAVCENT from acting to deter or counter Iraqi forces from setting mines adrift in the Gulf.

After the RSNF discovered the first drifting mine in December, the USMCMG found and destroyed six drifting mines before Operation Desert Storm started. On 24 January, the USMCMG left Abu Dhabi and conducted training and maintenance while enroute to its designated MCM operating area in the northern Persian Gulf. On 14 February, the oceanographic survey vessel *HMS Herald* and five Royal Navy mine hunters joined the USMCMG. This task force started its MCM operations on 16 February, 60 miles east of the Kuwaiti coast, working initially to clear a 15-mile long, 1,000 yard wide path to a 10-mile by 3.5-mile FSA south of Faylaka Island.

While sweeping toward the shore of Faylaka Island on 17 February, the MCM force was targeted by Iraqi Silkworm antiship missile fire control radars in Kuwait. The ships moved out of the missile's range while Coalition forces located and attacked the radar site. With the Silkworm missile threat diminished, the MCM forces began to move back to the previous minesweeping areas at 0240 on 18 February. At 0435, after operating for 11 hours in an undetected Iraqi minefield, *USS Tripoli* hit a moored contact mine in 30 meters of water. The explosion ripped a 16 foot by 20 foot hole below the water line. As *USS Avenger* and *USS Leader* attempted to assist the damaged warship, *USS Princeton* (CG 59), while unknowingly heading along a line of Manta mines, continued to provide air defense for the MCM Group. At 0715, *USS Princeton* actuated a Manta mine in 16 meters of water. A sympathetic actuation of another mine about 350 yards from *USS Princeton* occurred about three seconds later. These mine blasts caused substantial damage to *USS Princeton*, including a cracked superstructure, severe deck buckling, and a damaged propeller shaft and rudder. As damage control teams overcame fires and flooding aboard *USS Tripoli* and *USS Princeton*, the minesweepers *USS Impervious*, *USS Leader*, and *USS Avenger* searched for additional mines in the area. The minesweeper *USS Adroit* led the salvage ship *USS Beaufort* (ATS 2) toward *USS Princeton*; *USS Beaufort* then towed the damaged warship to safety.

USS Princeton restored her TLAM strike and Aegis AAW capabilities within two hours of the mine strike and reassumed duties as the local AAW commander,

providing air defense for the Coalition MCM group for 30 additional hours until relieved. *USS Tripoli* was able to continue her mission for several days before being relieved by *USS Lasalle* (AGF 3) and *USS New Orleans* (LPH 11). The amphibious assault ship *USS New Orleans* detached from the ATF and provided the flight deck for AMCM helicopters while the USMCMG staff moved aboard *USS Lasalle* to continue coordinating the mine clearing operations. *USS Tripoli* then proceeded to Bahrain for repair.



Figure VII-20
Damage to USS Tripoli (LPH 10) Caused by
an Iraqi Mine

Charts and intelligence captured from Iraqi forces showed the minefield where *USS Tripoli* and *USS Princeton* were hit was one of six in a 150-mile arc from Faylaka Island to the Saudi-Kuwaiti border. Within the arc, there were four additional mine lines, with more than 1,000 mines laid before Operation Desert Storm began.

The initial intelligence assessment, based on limited knowledge of Iraqi minelaying operations and on observations of the transit of an Iraqi merchant ship through the area, was that the Iraqis had placed their minefields closer to the coast. As a result, Coalition MCM forces initially passed through the outermost minefield and started MCM operations near a second barrier of bottom mines. The *USS Tripoli* and *USS Princeton* incidents proved the initial assumption incorrect. The Coalition forces revised the MCM plan, extended the transit lanes 24 miles to the east, moved the MCM and NGFS task groups back out of the Iraqi minefield to unmined areas, and then resumed MCM operations.

USS Princeton Mine Incident

Commanding Officer, USS Princeton – *"The ship was steaming slowly, barely maintaining steerageway in order to allow maximum reaction time if a mine was spotted. I had just told the crew that we had to be especially cautious and be on the lookout for mines because Tripoli had been hit just hours earlier. Just as I made that comment, the force of the mine explosion under the stern lifted up the ship and caused a whiplash. We on the bridge were moving up and down rapidly. We all grabbed on to something and tried to maintain our footing. . . My immediate reaction was that we had hit a mine. But the fact that the ship continued this violent motion for more than a second or two concerned me. I didn't expect the violent motion to continue as long as it did. At this point, both the Boatswain's Mate-of-the-Watch and I sounded General Quarters."*

Two seconds after the mine exploded under the stern another mine exploded about 300 yards off the starboard bow. The combined effect of these two mines ripped the ship's superstructure in two at the amidships quarterdeck.

"My first reaction was to notify someone else that we had struck a mine. We had to keep the ship from sinking. Another immediate reaction was that this was what we had been preparing for months. I had total confidence that my crew would do the right thing – that they would do what they had been trained to do."

"The first report that came in was about the injured people on the forecastle. Petty Officer . . . was already there giving first aid to Petty Officer . . . , who was the most seriously injured. Petty Officer . . . was standing right at the bullnose looking for mines when the blast went off under the stern. Petty Officer . . . was thrown 10 feet into the air."

(Continued on next page)

USS Princeton Mine Incident (Continued)

Near the ship's stern, where the most serious damage occurred, the firemain ruptured and doused an electrical distribution switchboard, causing a major electrical fire hazard. The switchboard was remotely isolated after the rupture was reported to Damage Control Central. The mine blasts also ruptured fuel tanks, forcing damage control parties to work in a mixture of fuel and water. Automatic sprinklers near the after 5-inch gun mount activated which aggravated the ship's flooding problem. The crew installed and activated dewatering systems within 10 minutes of the explosions and thus reduced the danger of both fire and flooding.

Loss of cooling water to electronic equipment, due to ruptured piping, disabled the ship's combat systems. Damage control teams quickly isolated the ruptures and immediately began emergency repairs to the cooling water systems.

"Within two hours the combat systems and combat information center teams had their equipment back on line with the forward gun and missile systems ready to shoot. Princeton reassumed duties as the local AAW commander and did not relinquish those duties until relieved by USS Valley Forge."

"As the day wore on I was concerned about drifting around in the mine field. So I made the decision to have the salvage ship, USS Beaufort, take us in tow since our maneuverability was not good. Once under way, we moved slowly west with the minesweeper, USS Adroit, leading us, searching for mines. USS Beaufort continued to twist and turn, pulling us around the mines located by USS Adroit and marked by flares. Throughout the night, USS Adroit continued to lay flares. Near early morning, having run out of flares, she began marking the mines with chem-lights tied together. The teamwork of USS Adroit and USS Beaufort was superb."

"I felt the life of my ship and my men were in the hands of this small minesweeper's commanding officer and his crew. I directed USS Adroit to stay with us. I trusted him and I didn't want to let him go until I was clear of the danger area. All of us on USS Princeton owe a big debt to the officers and crew of USS Beaufort and USS Adroit. They were real pros."

On 27 February, USS Avenger, using the AN/SQQ-32 MCM sonar, detected, classified and marked a bottom influence mine similar to the type that had struck USS Princeton – the first bottom influence mine ever found intact during combat. Divers from EOD Mobile Unit 6 placed neutralizing charges and detonated the mine.

After the cease-fire, MCM assets from Belgium, France, Germany, Italy, Japan, and the Netherlands joined the MCM group. This MCM force swept paths to

Kuwait's ports and completed Persian Gulf mine clearing operations by 10 September 1991.

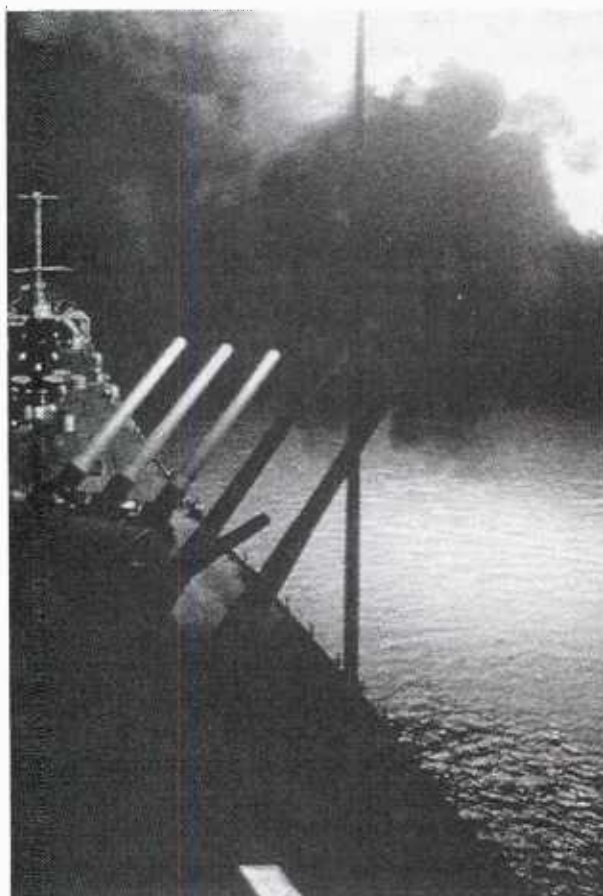
Impact of Iraq's Mine Warfare

Although the Iraqi minefields were not placed to maximize their effectiveness and many mines were deployed improperly, mine warfare had a considerable effect on Coalition maritime operations in the Persian Gulf. Kuwait's relatively short coastline, combined with the large Iraqi mine inventory, caused the Coalition MCM forces to plan and conduct MCM operations in support of an amphibious landing through dense minefields while vulnerable to missile, artillery, and small boat attacks from fortified beaches. Considering hydrographic and operational characteristics, an amphibious landing probably could only occur between Kuwait City and Ras Al-Qul'ayah, along 30 miles of coastline.

Many deployed mines lacked sensors or batteries which prevented their proper operation. During MCM operations, 95 percent of the UDM-type acoustic influence mines were evaluated as inoperable. Several moored contact mines were recovered on the bottom and apparently 13 percent of the moored mines broke away from their moorings. However, even the poorly planned and improperly deployed minefields caused damage to two combatants and were one of several reasons the amphibious invasion was not conducted. (Other factors, such as collateral damage to Kuwait's infrastructure, risks to the landing force, and lack of a MARCENT requirement for a coastal supply route, are discussed in this chapter's Amphibious Warfare section.)

NAVAL GUNFIRE SUPPORT (NGFS)

In addition to playing a major role in launching TLAM strikes against Iraq, the battleships *USS Wisconsin* and *USS Missouri* contributed the firepower of 16-inch guns in support of Coalition ground forces ashore. This NGFS marked the first time both battleships had fired in combat since the Korean War. The 16-inch NGFS in Operation Desert Storm also may have been an historical event – the final combat operations of the battleship.



*Figure VII-21
USS Missouri Provides Night NGFS during
Operation Desert Storm*

NGFS Missions

To defend against an amphibious landing by Coalition forces, Iraq had positioned a large proportion of its troops and weapons along the Kuwaiti coastline. This positioning exposed Iraqi forces to offshore naval gunfire; however, the combination of local hydrographic features and the Iraqi mine threat precluded the effective use of the 5-inch gun against shore targets; therefore the battleship's 16-inch gun was used primarily for NGFS. (The limited water depths in the area held ships several miles off the coast, out of the 5-inch gun's effective range, while the Iraqi mine threat prevented free movement of ships up and down the coast).

NGFS missions were allocated to both amphibious forces and ground forces and were divided into four major target areas: the Kuwait-Saudi Arabia border

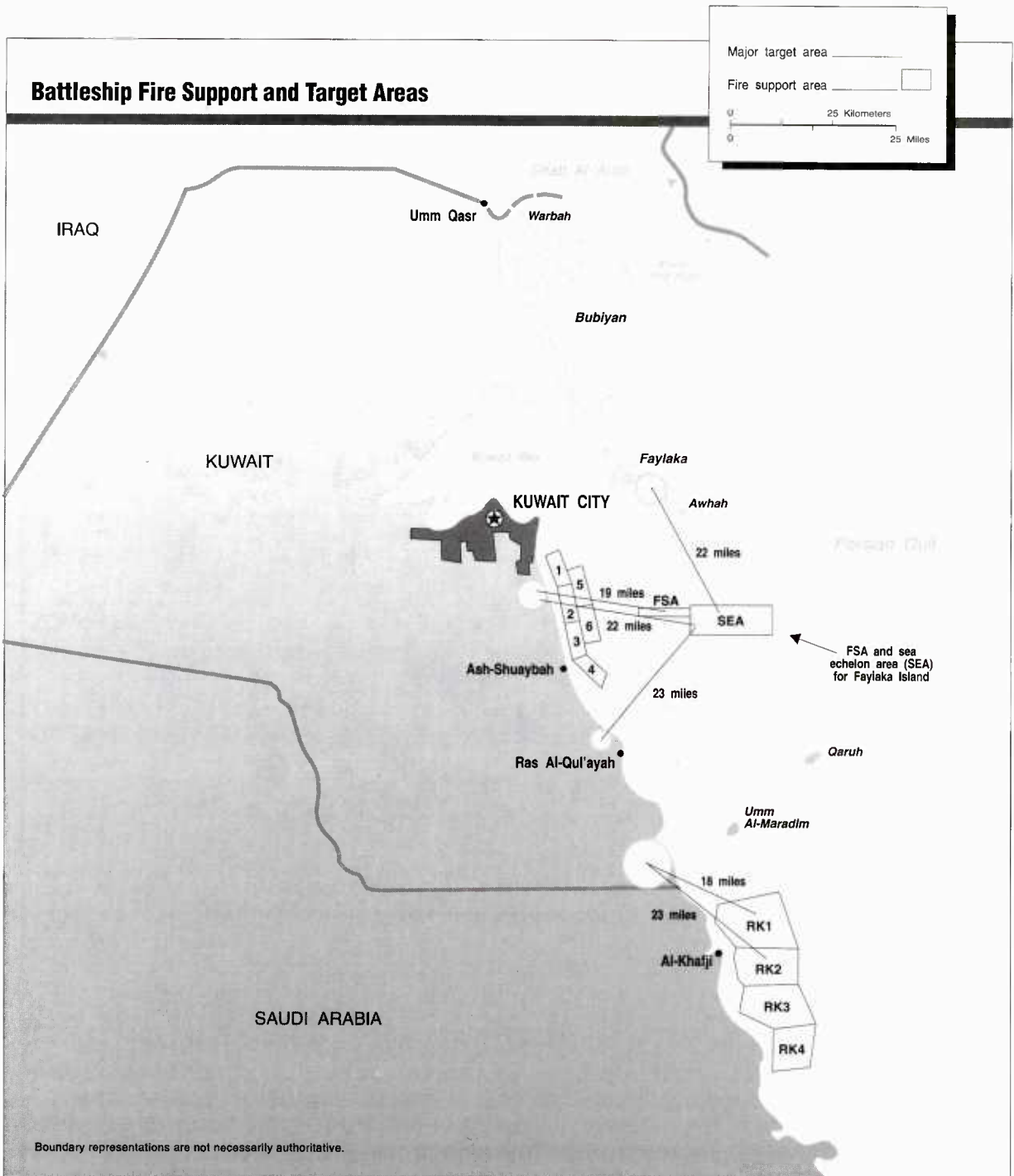


Figure VII-22

area, the Ras Al-Qul'ayah area, the area north of Ash Shuaybah, and Faylaka Island (Figure VII-22). At the start of the theater campaign's battlefield preparation phase, neither battleship provided NGFS because of the mine threat and navigational hazards off the Kuwaiti coast. After the battle of Ras Al-Khafji, at least one battleship was stationed off the coast of Ras Al-Khafji at FSA RK2 (Figure VII-22) from

4 to 9 February. Until the start of the ground offensive, the battleships were on seven-hour alert to MARCENT requests for fire support. During the ground offensive, the theater campaign plan required at least one battleship to provide NGFS to the Commander, Joint Forces Command-East (JFC-E) and MARCENT.

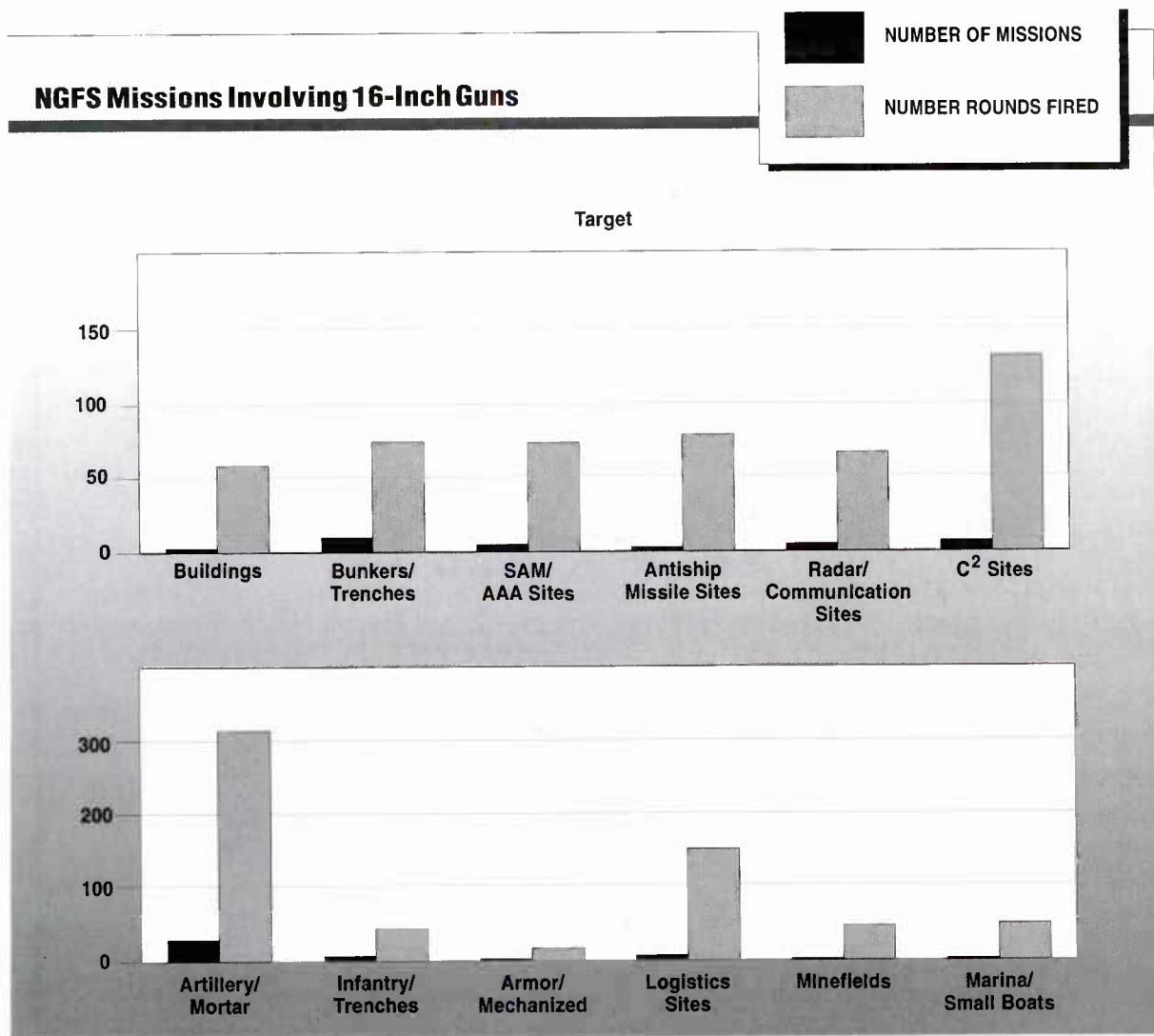
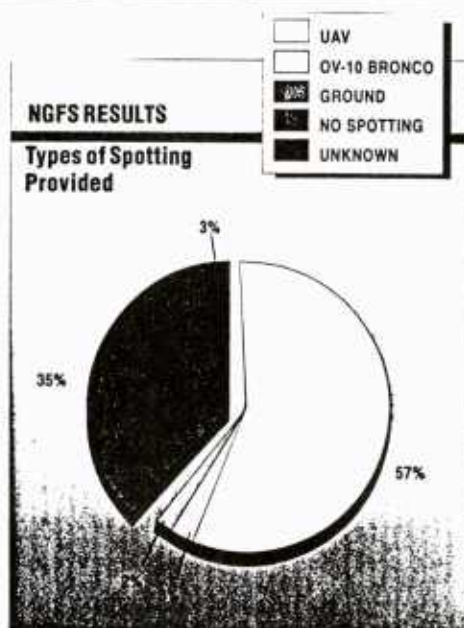
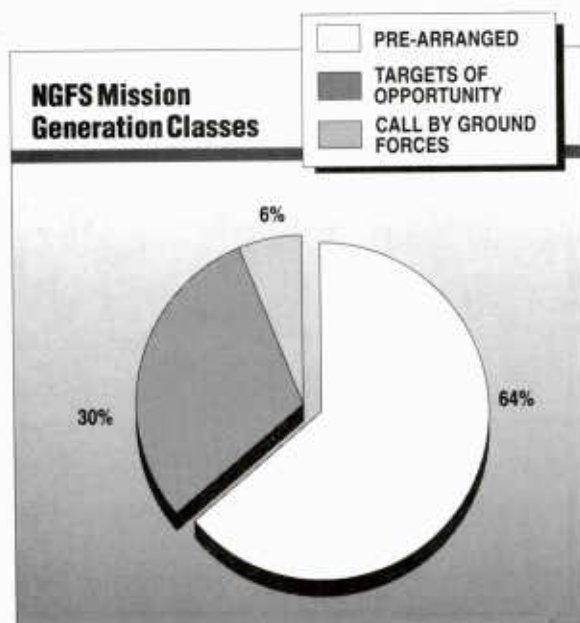


Figure VII-23

During Operation Desert Storm, battleship NGFS missions were generated in three ways: pre-arranged fires, self-determined targets of opportunity, and fires called for by ground forces. Before 15 February, NGFS missions focused more on command, control, and communications (C3) facilities, radar sites, and electronic warfare sites. Once the ground offensive began, the focus shifted to artillery positions, mortar batteries, ammunition storage facilities, logistics sites, Silkworm antiship missile batteries, and troops on beaches. Only six percent of the missions

were fired in a direct support role responding to calls from ground forces. This small percentage was due primarily to MARCENT's inland position beyond NGFS range before the ground offensive and the rapid Coalition advance during the ground offensive.



Figures VII-24, 25

NGFS Operations

On 4 February, *USS Missouri*, escorted by *USS Curts* using an advanced mine avoidance sonar (a modified hull mounted SQS-56 sonar), threaded through a mine cleared channel and unlighted navigational hazards to a position close to the coast (FSA RK2). With Marines providing fire control direction, *USS Missouri's* 16-inch guns fired 2,700-pound shells onto Iraqi C3 bunkers, artillery emplacements, radar sites, and other targets. Between 4 and 6 February, *USS Missouri* fired 112 16-inch shells, 12 five-inch shells, and successfully used an Unmanned Aerial Vehicle (UAV) in support of combat missions.

USS Wisconsin, escorted by *USS Nicholas*, relieved *USS Missouri* on 6 February. On her first mission, the most recently recommissioned battleship fired 11 shells 19 miles to destroy an Iraqi artillery battery in southern Kuwait. Using an UAV for spotting, *USS Wisconsin* attacked targets ashore, as well as small boats which were used during Iraqi raids along the Saudi coast. *USS Wisconsin's* guns opened fire again on 8 February, destroying Iraqi bunkers and artillery sites near Ras Al-Khafji.

"The USMC OV-10 observation aircraft spotted an Iraqi artillery post in southern Kuwait that had been harassing Coalition troops in Saudi Arabia. The plane relayed the coordinates to USS Wisconsin which silenced the enemy emplacement with 16-inch shells. The emplacement was hit at an estimated range of 19 miles from USS Wisconsin. After the shelling the pilot of the OV-10 reported back, 'Artillery destroyed.'"

Intelligence Officer, USS Wisconsin

Both battleships also used 16-inch guns to destroy enemy targets and soften defenses along the Kuwaiti coastline in preparation for a possible amphibious assault. On 21 February, the battleships moved north to conduct battlefield preparation as the ground offensive neared. As *USS Wisconsin* and *USS Missouri* operated in the FSA south of Faylaka Island, which had been cleared recently of mines, the 16-inch guns continued to fire at Iraqi targets.

On 23 February, the night before the ground offensive started, *USS Missouri's* guns fired pyrotechnic shells onto Faylaka Island to convince Iraqi troops an amphibious invasion had begun. *USS Wisconsin*, accompanied by *USS McInerney* (FFG 8), moved in closer to the Kuwaiti coast to complement the deception. NGFS continued against Faylaka Island on 24 February to deceive the Iraqis that a large-scale amphibious assault was imminent.

As Coalition ground forces advanced around and through the Iraqi defenders in Kuwait, *USS Wisconsin* and *USS Missouri's* guns continued to support them. The

battleships provided NGFS during the ground offensive to Joint Forces Command-East (JFC-E) on several occasions against dug-in Iraqi positions. On 26 February, the battleships provided support to the 1st Marine Division (MARDIV) when naval gunfire struck Iraqi tanks dug in at the Kuwait International Airport. *USS Wisconsin* fired the last NGFS of the war; together, both battleships passed the two million-pound mark in ordnance delivered on Iraqi targets by the cease-fire on 28 February.

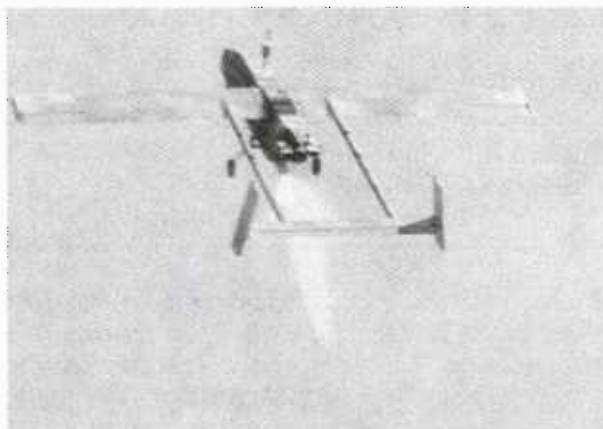


Figure VII-26
USS Wisconsin's UAV heads for a spotting mission

Use of UAVs

The battleships used UAVs extensively in NGFS for target selection, spotting, and BDA. The UAV accounted for 52 percent of spotting and virtually all BDA support the battleships received. The battleships were able to generate NGFS missions using organic UAV for spotting. Targets of opportunity accounted for 30 percent of the total missions and about 40 percent of the shells fired. Using an UAV in this manner increased the battleship's flexibility to provide NGFS because it allowed each battleship to receive real-time target acquisition and BDA without relying on external spotting and intelligence assets.

In addition to direct support of NGFS missions, UAVs also were used to gather intelligence on Faylaka Island when national sensors were not available and weather prevented aircraft reconnaissance. Over Faylaka Island, *USS Wisconsin's* UAV recorded hundreds of Iraqi soldiers waving white flags – the first-ever surrender of enemy troops to an unmanned aircraft. After the cease-fire, UAVs monitored the coastline and outlying islands in reconnaissance support of occupying Coalition forces. Because UAVs were under direct tactical control of combat forces, they could

respond quickly in dynamic situations. On one occasion, *USS Wisconsin's* UAV located two Iraqi patrol boats, which were sunk by aircraft directed to investigate.

NGFS Results

Sixty-five percent of all the fire support missions and 90 percent of all rounds fired received some degree of spotting support. When spotting was not available for a mission, only three or four rounds were fired, usually to harass Iraqi artillery or troop positions. The two battleships fired 1,102 rounds of 16-inch shells in 83 individual missions. Approximately 2,166,000 pounds of ordnance were delivered. The average range for the NGFS missions was approximately 22 miles, with all but 16 missions having ranges exceeding 18 miles.

BDA was obtained for 37 of the 52 missions where spotting was used. Damage was classified as light for 40 percent of these missions, while about 30 percent of the missions inflicted moderate to heavy damage or targets were evaluated as neutralized or destroyed. As expected, a higher percentage of point targets was destroyed, neutralized, or heavily damaged than area targets because area targets are made up of many, smaller individual targets. For point target missions with BDA available, 28 percent were classified as heavily damaged, neutralized, or destroyed.

AMPHIBIOUS WARFARE



Figure VII-27
Iraqi Beach Defenses near Kuwait City

A major maritime campaign component centered on preparing for and executing amphibious operations during the ground offensive. For this purpose, the USMC deployed the 4th and 5th Marine Expeditionary Brigades (MEB) and 13th Marine Expeditionary Unit (Special Operation Capable) (MEU (SOC)) aboard amphibious ships to the Persian Gulf. Continuous planning for amphibious operations started when the lead elements of the 4th MEB and Amphibious Group 2 deployed to Southwest Asia (SWA) from the US East Coast in mid-August. Concurrently, the 13th MEU (SOC), aboard ships of Amphibious Squadron 5, which already were deployed to the Western Pacific, sailed for SWA. Upon its arrival, this amphibious force joined the East Coast amphibious force to form the amphibious task force (ATF). At the time of these deployments, the distinct possibility existed that an amphibious assault would be required to defend against an Iraqi invasion of Saudi Arabia. In fact, during the initial deployment of Operation Desert Shield, the ATF provided CINCCENT's only forcible entry capability.

In the weeks leading up to the ground offensive, amphibious warfare planners afloat responded to tactical missions, which required them to develop plans ranging from large-scale amphibious assaults into Kuwait to raids and feints on islands and coastal areas. Additionally, as part of the theater campaign plan, the ATF conducted several well-publicized landings in Oman and the southern Persian Gulf. Finally, when the ground offensive began, the ATF conducted feints and raids, and was ready to conduct a large-scale amphibious assault if required. Although a major amphibious operation was not conducted, the ATF played a crucial part in the overall success of Operation Desert Storm by fixing large numbers of Iraqi troops near the Kuwaiti coast and preventing their use in inland operations.

The Iraqi Threat

The unique geographic and military situation in the Persian Gulf meant an amphibious assault would be conducted against a heavily defended landing beach. The ATF was confronted with formidable coastal and beach defenses. One observer, who later examined Iraqi defenses along the Kuwait border, described them as more formidable than those encountered by Marines during many of the World War II Central Pacific battles. In the area close to shore, the Iraqis placed underwater obstacles, mines and barbed wire to ensnare and disable landing craft and vehicles. Between the low and high water marks, additional mines and barbed wire were positioned to stop infantry. Behind the beaches, the Iraqi defenders dug trench lines and bunkers, and, in the urban areas from Ash Shuaybah north, fortified buildings. Berms, minefields, antitank ditches, dug-in tanks and barbed wire blocked beach exits. To the rear, artillery, and mobile reserves stood ready to counterattack any Marines able to break through the beach defenses. At least three enemy infantry divisions were assigned to defend the Kuwaiti coast from Kuwait City south to the Saudi-Kuwaiti border. Additional Iraqi infantry divisions defended the coast north of Kuwait City. These forces were backed by the 5th Mechanized Division, in reserve

near Al-Ahmadi. Similar defenses existed on Faylaka Island, defended by the Iraqi 440th Marine Brigade, and on Bubiyan Island.

Amphibious Warfare Planning

The ATF began preparations for offensive amphibious operations as soon as it reached the theater in mid-September. This force provided an important seaborne threat to the flank of Iraqi forces who, it was feared, might attack Saudi Arabia along the main coastal road from Ras Al-Khafji to Ad-Dammam. In late October, the ATF conducted amphibious exercises at Ras Al-Madrakah, Oman, providing the opportunity to rehearse generic landing plans. Meanwhile, the 13th MEU (SOC) participated in Maritime Interception Operations and then left SWA on 10 November to conduct exercises in the Philippines. In mid-November, the ATF conducted a highly publicized amphibious exercise along the eastern Saudi Arabian coast, in conjunction with Exercise Imminent Thunder, a final rehearsal of CINCCENT's defensive plans. This exercise was the first in a continuous series of operations carefully designed to deceive the Iraqi command as to the direction of the Coalition's ground attack. A few weeks later, the ATF returned to Ras Al-Madrakah to conduct Exercise Sea Soldier III. By this time, the ATF had received preliminary guidance that its assault objective during the ground offensive would be along the Kuwaiti coast, precipitating staff rehearsals and planning to counter the extensive Iraqi coast defenses.



Figure VII-28
Marines Conduct an Amphibious Landing Exercise in Oman

As Operation Desert Storm approached, amphibious planning intensified. On 30 and 31 December, an amphibious planning conference was conducted aboard *USS Blue Ridge* (LCC 19), during which the evolving ground offensive plan, and the ATF's role in it, was discussed. MARCENT continued to express concern, and VII Corps later concurred, that if the ground campaign became extended, then a secure port on the Kuwaiti coast would be needed to provide logistic support. I MEF had shifted more than 50 miles inland and MARCENT was concerned about the strain that position placed on logistics lines. Rather than trying to support the entire advance logistically from Saudi Arabia, MARCENT desired an amphibious landing to open a forward logistics base in Kuwait to take advantage of available sea-based logistics. The prospects for conducting an amphibious assault increased. Furthermore, the planning conference re-emphasized the ATF's requirement to plan for raids and feints along the Kuwaiti coast to fix Iraqi attention away from ground forces moving west.

On 6 January, NAVCENT issued a warning order directing the ATF to finalize plans for an amphibious assault on the Kuwaiti coast. The final plans for what had become known as Operation Desert Saber called for the ATF to conduct an amphibious assault north of Ash Shuaybah, establish the landing force ashore, and link up with MARCENT. The amphibious assault's objectives were to reduce the threat facing MARCENT by fixing enemy forces along the Kuwaiti coastline and destroying enemy forces in the beachhead area, and to seize the port facilities at Ash Shuaybah for sustained logistic support of MARCENT.

Based on the expected rate of advance of the ground offensive, the time needed to place amphibious forces into position after the ground campaign began, and the desire to fix as many Iraqi forces in coastal positions as possible, preliminary time lines scheduled the amphibious landing to take place four days after the ground offensive began. The plan envisioned the initial landing would be north of the Ash Shuaybah refinery. The landing force would then attack to the south to secure the port. A potentially serious obstacle to the attack was a liquid natural gas plant near the port complex; the plant's explosive potential posed a serious danger to the landing force. The damage the plant's destruction might cause to the surrounding Kuwaiti infrastructure caused CINCCENT to place it on the list of targets prohibited from attack by Coalition forces during the air campaign. In addition, a large number of high-rise apartment complexes and condominiums near the waterfront provided the Iraqis excellent defensive positions from which to oppose the landing. They, too, were not on CINCCENT's approved target list. These obstacles complicated the amphibious operations planning and decision making.

Available amphibious forces more than doubled in mid-January. Amphibious Squadron 5, with the 13th MEU (SOC) embarked, returned to the Persian Gulf on 12 January. Amphibious Group 3 with the 5th MEB embarked, which had left California in early December, also arrived in the theater on 12 January, and was integrated immediately into the ATF. Amphibious forces then consisted of 36 ships (31 amphibious assault ships and five Military Sealift Command ships) carrying the landing force (the assault echelon of the 4th and 5th MEBs, and the 13th MEU (SOC). The landing force commander (CLF), preferring the flexibility the Marine Air-Ground

Task Force (MAGTF) structure provided for multiple missions, opted to retain that structure for the subordinate units rather than attempt to combine them into one large MAGTF. The 13th MEU (SOC) was assigned the task of conducting advanced force operations and raids, while the 4th and 5th MEB remained capable of attacking separate objectives or, if necessary, joining as a single composite unit.

With the opening of the air campaign on 17 January, amphibious warfare planning and training accelerated. Along with 31 amphibious ships, the ATF also had one repair ship, 17 Landing Craft Air Cushion (LCAC) and 13 Landing Craft Utility (LCU). The landing force had approximately 17,000 Marines, built around two regimental landing teams, with five infantry battalions, plus supporting arms, including tanks, antitank vehicles, and light armored vehicles (LAV). In addition to the LCUs and LCACs available within the ATF, ship-to-shore movement also could be supported by 115 assault amphibian vehicles (AAV). The landing force's Air Combat Element included 19 AV-8Bs and 136 helicopters.

Exercises and planning surfaced several issues that needed resolution before the ATF could conduct an assault. Among them were problems of defining an amphibious objective area, given the expected close proximity of any landing to advancing Coalition ground forces; fire support and airspace coordination issues; and, link-up procedures in a rapidly moving ground offensive. Workaround procedures were developed, however. Foremost among the ATF's concerns was integrating its plans into the air campaign, and ensuring the JFACC targeting process considered the ATF's needs. To accomplish this, an ATF targeting cell was formed, composed of both Navy and USMC officers, who developed targets and submitted reports and requests directly to the JFACC in Riyadh for incorporation into the ATO. To assist NAVCENT, and to provide closer liaison between NAVCENT, MARCENT, and CINCCENT, the USMC sent a planning staff to NAVCENT's flagship, *USS Blue Ridge*. This planning staff helped with the complex coordination between the ATF and forces ashore.

Because amphibious ships also were deployed to other regions to respond to potential crises, the number of amphibious ships deployed to the Persian Gulf, although sizable, was not enough to load the full assault echelons of two MEBs. Normal USMC practice involves loading amphibious ships so crucial pieces of equipment, particularly helicopters, are not concentrated on one or a few ships. The distribution of amphibious forces during the deployment to the Gulf resulted in the concentration of most or all of a particular aircraft type on a single ship. This practice had some administrative and maintenance advantages during the buildup and required fewer support personnel and equipment. However, it limited flexibility and exposed the landing force to serious degradation if ATF ships were damaged or, as later occurred, detached from the ATF to support MCM operations. Furthermore, because of the unavailability of amphibious lift in the theater, some of 5th MEB's assault echelon equipment was loaded aboard two MSC ships that were unsuitable for amphibious assault operations.

An additional concern centered on the composition of the Assault Follow-On Echelon (AFOE), which carried supplies and equipment for 4th MEB's sustainment of

operations once ashore. Initially, the AFOE was loaded on five MSC ships. These ships, none of which had been specifically designed for amphibious assaults, had only a limited capability to conduct in-stream unloading, and virtually no capability for logistics-over-the-shore operations. In addition, two ships required pier cranes for unloading cargo because of inadequate onboard cranes. Moreover, Kuwaiti ports probably would not be available initially during an amphibious assault. These limitations severely reduced these ships' effectiveness in supporting an amphibious assault in such an austere operating environment. Because of the AFOE ships' operational shortfalls, they were unloaded in November and the equipment and supplies loaded onto two Maritime Prepositioning Squadron (MPS) roll-on/roll-off ships which had delivered their prepositioned equipment. These MPS ships were ideally configured for AFOE use because of their in-stream unloading capabilities.

Intelligence collection also became a concern during Operation Desert Storm. Because of competing theater requirements, the ATF was given lower priority for theater and national intelligence collection assets.

Near-shore and beach mines presented obstacles to the ATF. In an assault, AAVs emerging from the surf would be endangered, as would debarking infantrymen. The 4th and 5th MEB lacked the numbers and types of specialized engineer equipment available to the 1st and 2nd Marine Divisions. This shortage of mine clearing assets limited the size of planned initial surface assault waves, whose primary mission would be to clear the beaches. An amphibious assault would rely on heliborne waves that could secure the designated landing beaches from the rear. However, the primary USMC medium lift helicopter, the CH-46, had a limited range that would require the ATF ships to operate in areas suspected to be heavily mined.

An option considered for both a possible assault and a raid was an over-the-horizon (OTH) assault. The concept involves launching heliborne and surface assault waves at extended distances from the beach. OTH operations are practiced regularly as part of the MEU (SOC) training program and were demonstrated during Operation Eastern Exit in January when 4th MEB, unexpectedly tasked by CINCCENT, landed Marines in Mogadishu, Somalia, to protect and evacuate US citizens. In this operation, the 4th MEB used CH-53E helicopters launched from *USS Trenton* (LPD 14) 466 miles off Somalia's coast. An OTH assault requires both long-range helicopters and assault craft capable of open ocean operations, both of which the ATF had, but in limited numbers. Enough CH-53E and CH-53D heavy lift helicopters, with the required range, were available to lift an infantry battalion. The ATF's 17 LCACs, capable of high-speed, open-ocean operations, could land the assault elements of a battalion landing team, reinforced by the necessary tanks and LAVs. With ATF ships remaining well offshore to avoid detection, engagement by Iraqi defenses, and the mine threat, a smaller, but still potent landing force of about two reinforced battalions could be put ashore. This concept also would use extensive air support to shape landing zones and destroy beach defenses. An OTH amphibious assault with the available assets had risks, but was considered feasible. Several smaller raid packages also were planned using this concept.

Amphibious planning continued to focus on several options as the ATF adjusted to continuous changes in the military situation and a host of possible missions. In late January, the enlarged ATF conducted Exercise Sea Soldier IV in Oman. The exercise was again highly publicized to ensure the Iraqi command understood the Coalition's amphibious capabilities.

On 2 February, CINCCENT and MARCENT met with NAVCENT aboard *USS Blue Ridge* to discuss the timing and feasibility of amphibious plans. Estimates assumed the main assault would need 10 days of MCM operations to clear a path through Iraqi minefields and three to five days of NGFS and air strikes to neutralize Iraqi beach defenses. Shore bombardment and air strikes also would be needed before the landing to allow MCM forces to clear mines from near-shore waters well inside the range of Iraqi land-based artillery. Without a concentrated MCM effort, offshore mines essentially kept the ATF off the coast by as much as 72 miles. NAVCENT also pointed out the possibility of collateral damage to Kuwaiti territory from the NGFS and air strikes against the highly fortified beach front during MCM operations and the amphibious landing. The wholesale destruction of the Kuwaiti infrastructure that could result from necessary pre-assault operations, and the evident risks to the assaulting landing force, were serious considerations. On the other hand, since the start of Operation Desert Storm, USMC service support units and Navy Seabees had worked diligently to improve the overland transportation routes in their area of responsibility. The deployment of substantial USMC reinforcements also improved I Marine Expeditionary Force's (I MEF) logistics capabilities. MARCENT now believed the ground attack could be supported logistically without the need to open a coastal supply route.

As a result of these and other considerations, CINCCENT decided to exclude the amphibious assault from the initial ground attack, but the ATF was directed to prepare for a possible amphibious assault on Ash Shuaybah if the ground offensive required it, and to continue active operations as part of the theater campaign plan. Such an assault would be timed to coincide with I MEF's advance, and thus would be executed on short notice. Although planning for Operation Desert Saber continued as a contingency in case an assault proved necessary, the planning focus shifted. In an 8 February message to NAVCENT, CINCCENT noted, "an amphibious assault into Kuwait, or the credible threat to execute one, is an integral part of the overall campaign plan for Operation Desert Storm." CINCCENT also ordered NAVCENT to establish an amphibious objective area and begin pre-assault operations, including MCM, NGFS, deception measures, air and sea control, and threat suppression.

Although a large scale, preplanned assault against the Kuwaiti coast had been decided against, the ATF identified several possible raid targets, ranging from the Kuwaiti border to the Al-Faw Peninsula and began detailed planning for an attack on Faylaka Island. A week later, CINCCENT approved continued planning for NAVCENT's proposed option for an attack, raid, or demonstration against Faylaka Island, where intelligence sources estimated a 2,500-man brigade was stationed. The advantages of such an operation were that it could accomplish the objective of distracting Iraqi attention, continue to fix enemy forces along the coast, minimize collateral damage in Kuwait, and also reduce the required MCM effort.

Amphibious Operations

In addition to exercises, the ATF conducted five amphibious operations during Operation Desert Storm (Figure VII-30). On 29 January, the 13th MEU (SOC) raided Umm Al-Maradim Island off the Kuwaiti coast. Amphibious operations supporting the ground offensive were conducted from 20 to 26 February against Faylaka Island, the Ash Shuaybah port facility, and Bubiyan Island. The following section briefly describes these amphibious operations as well as the landing of the 5th MEB.

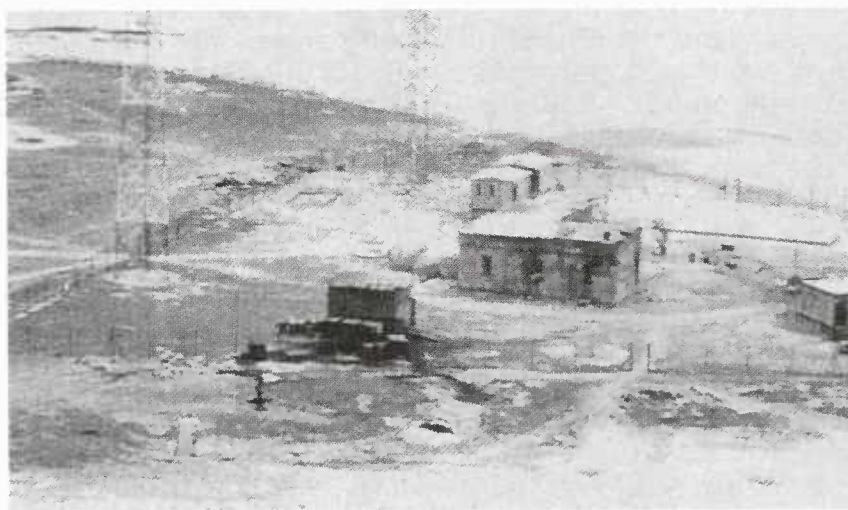


Figure VII-29
Iraqi Communication Facilities on Umm Al-Maradim Island

Umm Al-Maradim Island

Concurrently with Exercise Sea Soldier IV in mid-January, 13th MEU (SOC) moved into the Persian Gulf, having received a warning order to conduct a raid on Umm Al-Maradim Island off the Kuwaiti coast. To support this operation, Kuwaiti Marines were transferred to *USS Okinawa* to provide interpreter and EPW interrogation support as the MEU (SOC) moved toward the objective area. As an Iraqi radar and listening post, the island was thought to be occupied in company strength. Having rehearsed the raid during the preceding week, 13th MEU (SOC) assaulted the island on 29 January. For the Marines, however, the raid turned out to be anticlimactic. A Navy A-6, followed by Marine AH-1 helicopters overflew the

Amphibious Operations During Operation Desert Storm

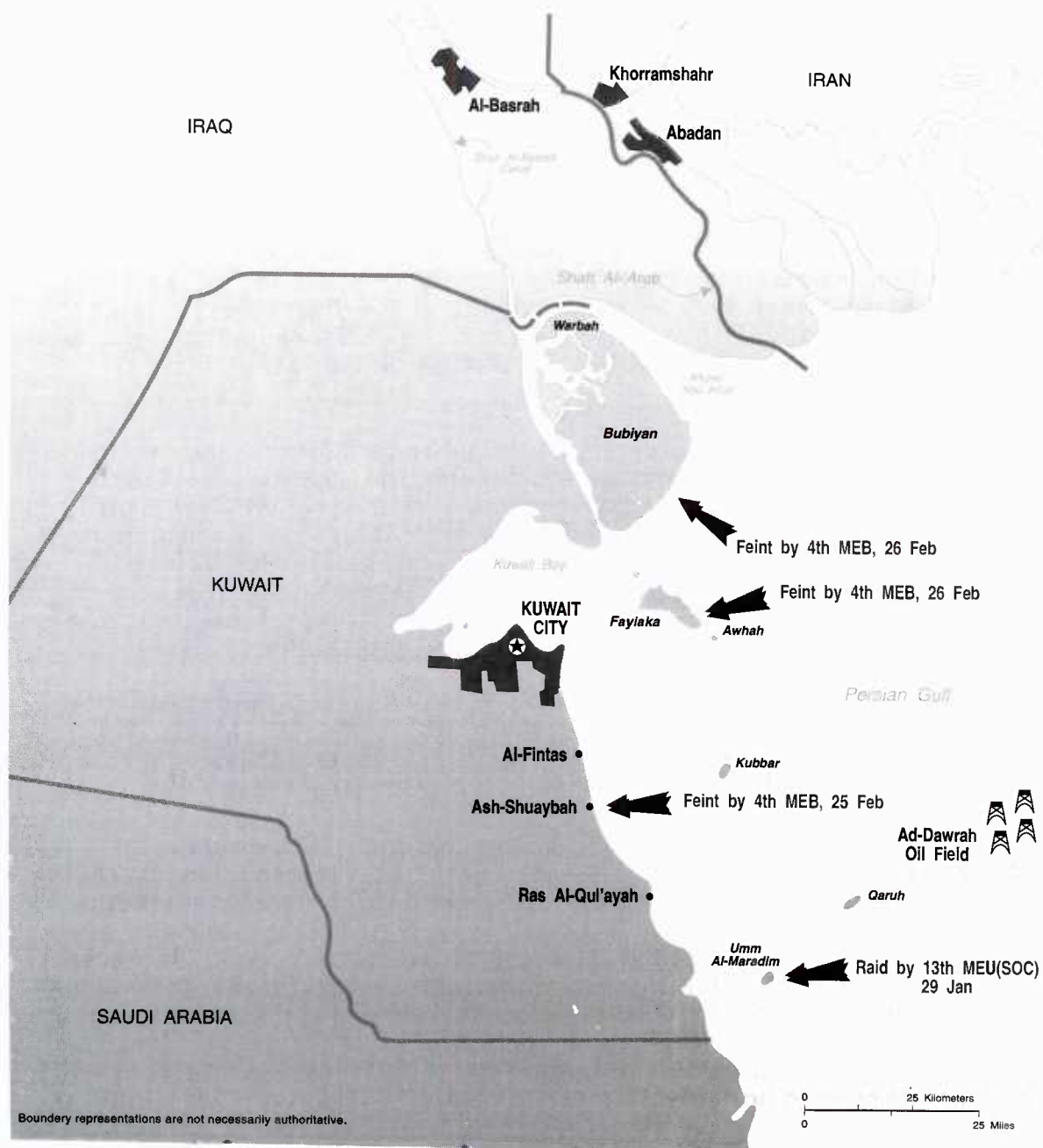


Figure VII-30

island and reported it apparently abandoned. When riflemen from C Company, 1st Battalion, 4th Marines landed by helicopter a few hours later, they found no Iraqis. Quickly removing documents and equipment found there, they destroyed Iraqi heavy equipment that could not be removed and returned to the ATF ships. Many documents provided intelligence on the extent of Iraqi mining in the northern Persian Gulf. The raid demonstrated to the Iraqis the capabilities of the amphibious forces, reinforced the theater deception plan, and captured documents provided intelligence for amphibious operations planning.

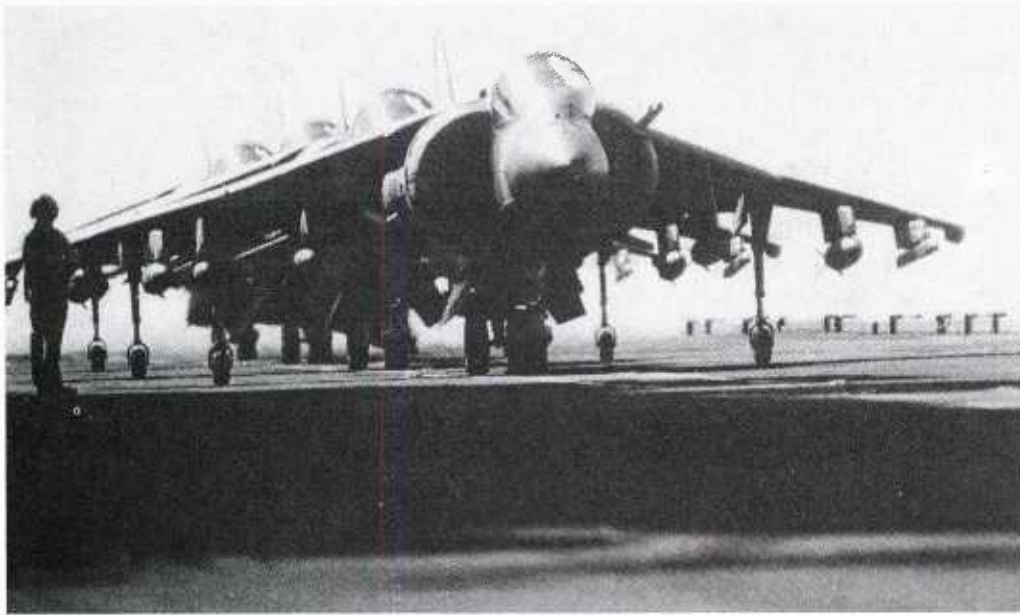
Faylaka Island

NAVCENT issued a warning order on 6 February for a raid on Faylaka Island. The ATF was ordered to plan an OTH raid on the island as a diversionary attack before the ground offensive began. The warning order also specified the force was not to become embroiled in a fight with Iraqi defenders if that would make withdrawal difficult.

On 11 February, NAVCENT ordered preliminary operations for the raid to begin. On 12 February, the ATF commanders met aboard *USS Nassau* (LHA 4) to work out the plan's final details. The final concept of operations was issued on 13 February. The plan called for landing a reduced infantry battalion (two companies) supported by LAVs, tanks, and High Mobility Multi-purpose Wheeled Vehicles mounting TOW launchers and heavy machine guns. The raid's objectives were to destroy communications facilities, radar sites, and a command post that had been identified by intelligence sources, as well as to capture Iraqi troops.

A rehearsal was conducted 15 February as NAVCENT, CATF, and CLF briefed CINCCENT on the planned raid. After the meeting with CINCCENT, NAVCENT directed MCM operations to begin the next day. Approximately 48 hours later, on the morning of 18 February, *USS Tripoli* and *USS Princeton* struck mines.

Following these mine strikes, NAVCENT directed the ATF to examine the feasibility of conducting the raid from areas east of the Ad-Dawrah oil fields. MCM forces were staged from that area, and launching a raid from there would reduce the MCM requirements considerably. Although CLF judged the full scale raid was infeasible because of the extended ranges, a reduced raid was possible. Renewed planning centered on options requiring about half the original force and involving no more than one trip for each LCAC or helicopter. The final plan used heliborne forces from 13th MEU (SOC). On 20 February and continuing for the next two days, AV-8B attack aircraft from 4th MEB, operating from the *USS Nassau*, attacked Faylaka Island. The scope of the raid was scaled back on 22 February and was called off completely on 23 February. NGFS continued as planned on 23 and 24 February to deceive the Iraqis into believing a full-scale amphibious assault was imminent.



*Figure VII-31
USMC AV-8Bs Prepare to Launch from USS Nassau*

Ash Shuaybah Port Facility

Late on 24 February, NAVCENT ordered the ATF to conduct a demonstration or feint before dawn near Ash Shuaybah. Coalition ground forces were advancing faster than expected and it was important to hold Iraqi forces defending along the coast south of Kuwait City in position and prevent them from moving into blocking positions or from reinforcing other Iraqi forces further inland. At 0300, *USS Missouri* conducted four NGFS missions in the areas around the simulated landing beaches. Helicopters from 13th MEU (SOC), launched from *USS Okinawa* about 0400, proceeded toward Al-Fintas on a heliborne feint, turned away about three miles from the beach, and returned to the ship about 0450. In the early morning darkness on 25 February, 10 USMC helicopters, some carrying EW emitters, dashed towards Ash Shuaybah, turning away at the last moment within sight of beach defenders, while *USS Portland* maneuvered offshore. The Iraqi response to the feint was immediate – two Silkworm missiles were launched toward Coalition naval forces. As described in detail earlier in this chapter, *HMS Gloucester* shot down one missile and the other missile landed in the water. At the same time, confused Iraqi anti-aircraft batteries fired into the air.

Bubiyan Island

Shortly before noon on 25 February, NAVCENT ordered additional demonstrations, feints, or raids on Al-Faw and Faylaka Island because of indications that Iraqi forces were moving from the Bubiyan Island and Al-Faw regions. Again, the ATF's objective was to hold the Iraqis in their beach defenses. The next night, a combined Navy-USMC force of helicopters, EW aircraft, and A-6Es carried out a feint towards Bubiyan Island. When Iraqi defenses responded with flares and anti-aircraft artillery, the A-6Es attacked. Concurrently with this feint, a smaller armed USMC helicopter force approached Faylaka Island, firing rockets and machine guns. Again, the Iraqi response was immediate, but confused.

Meanwhile, USMC AV-8Bs and AH-1W helicopter gunships from 4th and 5th MEB commenced operations in support of I MEF's attack into Kuwait. A detachment of six AV-8Bs from the *USS Tarawa* moved to a forward airfield at Tanajib to reduce response times for conducting deep and close air support missions, while the 4th MEB's AV-8Bs continued operating from *USS Nassau*. Both MEBs' helicopter gunships flew to forward sites near Al-Khanjar to support I MEF's advance.

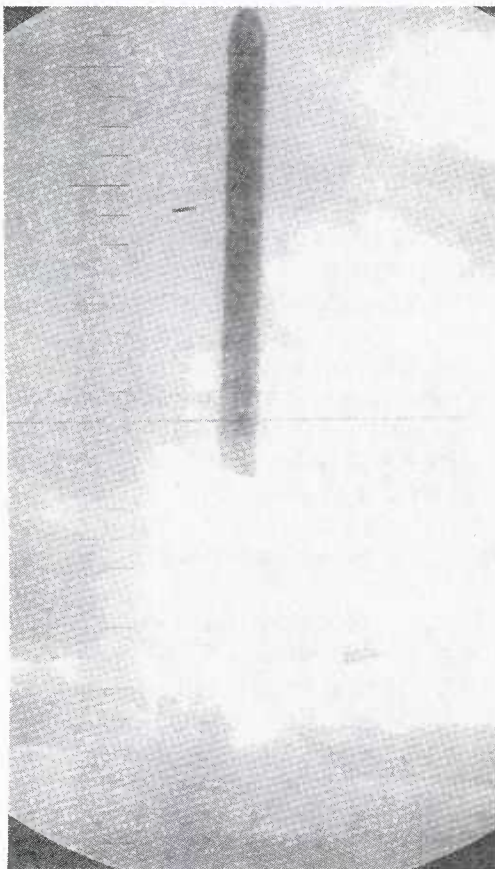
Landing of 5th MEB

The largest direct contribution to the ground offensive by amphibious forces, came from the 5th MEB, which began landing through Al-Mish'ab and Al-Jubayl, Saudi Arabia on 24 February to assume the mission of I MEF reserve. Although experiencing little active combat, the MEB assisted in mopping up operations, EPW control, and security duties, while providing the MEF commander, whose two Marine divisions were fully committed, added tactical and operational flexibility.

Effectiveness of Amphibious Operations

Given the time required to conduct MCM operations, the potential for extensive collateral damage to the Kuwaiti infrastructure, and the risk to the landing force, coupled with the changing situation ashore, CINCCENT opted not to execute a large-scale amphibious assault. The ATF, trained and organized for amphibious landings, could have carried out such an assault, although offshore mines and beach defenses may have inflicted substantial casualties. Using the OTH concept, a smaller landing was planned, which could have been conducted on short notice, if required. Variations of this OTH assault plan were used to conduct the amphibious feints. Both assault options presented the Iraqis with a substantial threat to their seaward flank. In the end, the successes of the theater deception plan and the relatively short ground campaign made an amphibious assault unnecessary.

SUBMARINE OPERATIONS



*Figure VII-32
A TLAM Flies Toward an Iraqi Target after
Being Launched from USS Pittsburgh*

Since Iraq had no submarines, there was no submarine threat to Coalition naval forces or merchant ships and ASW was not tested. However, Navy nuclear powered attack submarines (SSN) played a role in strike warfare and conducted a variety of missions in support of Operations Desert Shield and Desert Storm.

On 19 January, *USS Louisville* became the first submarine to launch a TLAM in combat when she fired five missiles at targets in Iraq in support of the Strategic Air Campaign. This action was the first combat for US submarines since World War II. *USS Louisville* launched three more TLAMs from the Red Sea before being relieved by the *USS Chicago* (SSN 721) on 6 February.

SUMMARY OF THE MARITIME CAMPAIGN

Once Operation Desert Storm began, the Coalition's maritime campaign in the northern Persian Gulf, including the liberation of the first Kuwaiti territory, the capture of the first EPW, and the threat of an amphibious assault, focused Iraqi attention to the sea rather than to the desert to the west. Coalition naval forces in the Gulf also provided the Coalition with a solid flank to protect the forces and facilities on the Arabian Peninsula. The Coalition's naval presence also reassured the friendly nations of the Gulf and deterred any temptations Iran may have had to intervene directly or to allow Iraq to exploit Iranian territorial waters and airspace to strike at Coalition forces. This seagoing barrier was especially comforting in the early days of the Iraqi Air Force's exodus to Iran, when the implications of that action were uncertain.

Coalition naval forces essentially destroyed the Iraqi Navy in three weeks, secured control of the northern Gulf, and maintained the region's sea LOC with minimal Iraqi interference. The destruction of the Iraqi naval threat limited Iraq's ability to lay additional mines in the area and let Coalition naval forces establish operating areas farther north, increasing the number of aircraft strike sorties that could be launched against targets ashore and permitting amphibious operations.

The Persian Gulf conflict presented an unprecedented AAW deconfliction challenge. All air operations over the Persian Gulf were conducted safely and successfully. From Operation Desert Shield through Operation Desert Storm, there was no AAW fire from friendly forces. Restricted geography, unusual radar propagation conditions, the proximity of the threat from Iraq, the large number of commercial airfields and air routes in the vicinity, and the limited time available to establish positive identification of potential hostile air contacts before their entry into engagement envelopes combined to form a most complex, demanding AAW environment. The Aegis and NTU AAW systems performed as designed to provide battle force commanders complete coverage of all air contacts.

The five months of Operation Desert Shield permitted the Iraqis to develop an extensive coastal defense system in Kuwait. The Iraqi mine threat affected almost all naval operations during the Persian Gulf Conflict. The Coalition's ability to conduct amphibious operations and NGFS was constrained by the minefields in the northern Persian Gulf. The mine threat also affected naval air strike operations because it forced the carrier battle groups in the Persian Gulf to operate at greater ranges from targets in Iraq. The presence of drifting mines in the southern Gulf or within a major port in the Gulf could have severely limited the rapid force build up in Operation Desert Shield. Similarly, the mines laid in Kuwaiti ports could have affected seriously the Coalition's ability to shift logistics support rapidly to those ports.

NGFS was a useful contribution to the Coalition's efforts during Operation Desert Storm. NGFS from *USS Wisconsin's* 16-inch guns supported JFC-E's attack up the Kuwaiti coast, especially when they breached Iraqi defenses. *USS Missouri's* NGFS contributed to maintaining the credibility of the amphibious assault option,

particularly after a 16-inch bombardment of Ras Al-Qul'ayah induced the Iraqi defenders to abandon fortified positions. *USS Missouri* also supported Marines at the Kuwait International Airport. The UAV proved to be an excellent complement to the battleships, allowing them to attack enemy targets without the need of outside assistance, particularly aircraft, for spotting.

The ATF's contribution to the theater campaign cannot be quantified, yet it was significant to the Coalition's success. Beginning in late October, the ATF carried out amphibious exercises and operations that focused the Iraqi command's attention to the coast of Kuwait. In large measure, Iraq's preoccupation with the defense of Kuwait, and particularly against an amphibious assault, facilitated the ground offensive's now famous left hook maneuver. The amphibious invasion was not an idle threat; had the ATF been directed to do so, it could have conducted a successful assault, although possibly with substantial casualties. The decision not to conduct that assault is a tribute to the success of the theater deception efforts. Since the ATF's presence was sufficient, the ATF accomplished its mission without having to fight. The flexibility of amphibious forces was demonstrated by the ATF's operations. Iraq's reactions, and refusal to evacuate coastal defenses even when ground forces were encircling the rear, testified to the effectiveness of these operations. In the same vein as the Coalition aircraft that bombed Iraqi forces, and the Coalition's ground forces that attacked through the desert, the ATF played a vital and integral role in Operation Desert Storm.

Although Iraq had no submarines and ASW was not tested, Navy nuclear powered attack submarines participated in the Strategic Air Campaign by launching TLAMs against many targets. Submarines also conducted such missions as intelligence and surveillance in support of Operations Desert Shield and Desert Storm.

OBSERVATIONS

Accomplishments

- The Persian Gulf conflict demonstrated that sea control is fundamental to successful power projection and revalidated the importance of maritime superiority to US global leadership.
- Coalition naval forces essentially destroyed the Iraqi Navy in about three weeks, which limited Iraq's ability to lay additional mines, allowed the carrier battle groups to move closer to Kuwait and increase the number of air strikes in the KTO, and permitted amphibious operations.
- All air operations over the Persian Gulf were conducted safely and successfully during the Persian Gulf conflict. There were no AAW engagements involving fire from friendly forces. Designated return corridors and flight profiles proved to be key methods to separate Coalition aircraft from potentially hostile ones.
- Battleship NGFS made a useful contribution to the Coalition's efforts during Operation Desert Storm. The 16-inch NGFS supported the JFC-E attack along the coast which secured the right flank of MARCENT's advance to Kuwait City and contributed to maintaining the continued credibility of the amphibious assault option.
- UAVs proved to be an excellent reconnaissance asset for the battleships, allowing them to attack enemy targets without the need of outside assistance, particularly aircraft, for spotting and intelligence support. Because the UAVs were under direct tactical control of the combat forces, they were able to respond quickly to changing situations and provide real-time information.
- The publicity associated with amphibious assault preparations, and the potential threat of an assault, forced the Iraqis to focus on their seaward flank, making it more difficult for them to reorient their defenses when the Coalition attacked their western flank. Although the assault never was carried out, the threat induced the Iraqis to fortify the coast and diverted manpower, materiel, and time from any westward extension of their fortified border positions.

Shortcomings

- Maintaining an accurate ASUW order of battle required the identification of Iraqi surface combatants and the accurate assessment of ASUW engagements. Lacking this information affected both the conduct of individual ASUW engagements and the strategy for future operations. Poor BDA resulted in unnecessary launches of additional ASUW aircraft to attack targets that were sinking or already sunk, or in missed opportunities to destroy targets that had been mistakenly reported as sunk by a previous strike.
- The Iraqi mine threat affected almost all Coalition naval operations during the Persian Gulf conflict. US MCM assets, developed in the Cold War context of a limited Soviet threat to US ports, performed as expected under a more strenuous scenario.
- Using MSC ships which were unsuitable for amphibious operations to load some of 5th MEB's assault echelon equipment and the 4th MEB's AFOE equipment degraded the ATF's capability to accomplish its mission.

Issues

- In addition to attacking underway Iraqi surface combatants, ASUW assets also struck other threats to the battle force, including actual and suspected Silkworm sites and high-value vessels detected in port. Considering such targets ASUW threats to the battle force allowed the ASUW commander to implement quick reaction strikes without any potential scheduling delays in the ATO targeting process. Allowing the ASUW commander to control strikes against battle force threats wherever they were located resulted in an operationally clearer division of offensive responsibilities between the ASUW commander and the strike warfare commander. The ASUW commander was responsible for protecting the battle force from antisurface threats and the strike warfare commander was responsible for conducting strike operations against theater targets.
- The most effective ASUW tactic used by the Coalition was the British Lynx helicopter, working with a controlling SH-60B, firing the Sea Skua missile. Providing Navy shipboard helicopters with a similar weapon would make them more effective in ASUW and extend the range of the ASUW striking power of US combatants.
- Amphibious assault remains one of the more difficult and dangerous military operations. However, amphibious forces provide a forcible entry capability and forward presence (independent of bases on foreign territory), which are of strategic and operational value.

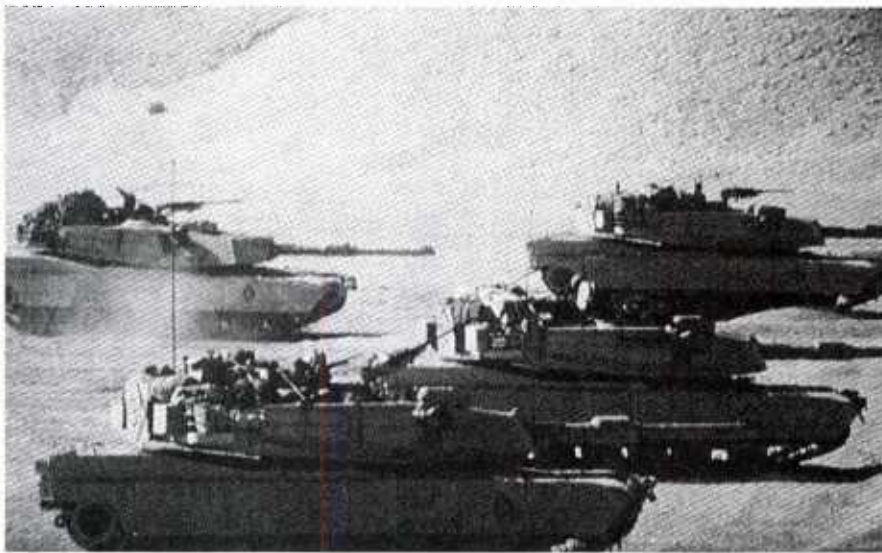
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CHAPTER VIII

THE GROUND CAMPAIGN

"You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life – but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men into the mud."

T. R. Fehrenbach
This Kind of War.



*Figure VIII-1
M1A1 Abrams Tanks in Iraq*

INTRODUCTION

Operation Desert Storm's final phase began early on 24 February, after more than 180 days of maritime interception operations and 38 days of aerial bombardment. The ground offensive's objectives were to eject Iraqi Armed Forces from Kuwait, destroy the Republican Guard in the KTO, and help restore the legitimate government of Kuwait. The plan envisioned a supporting attack along the Kuwait-Saudi Arabia border by the I Marine Expeditionary Force (I MEF) and Arab Coalition forces (JFC-E and JFC-N) to hold most forward Iraqi divisions in place.

Simultaneously, two Army corps, augmented with French and United Kingdom (UK) divisions – more than 200,000 soldiers – would sweep west of the Iraqi defenses, strike deep into Iraq, cut Iraqi lines of communication (LOC) and destroy the Republican Guards forces in the KTO.

By the morning of 28 February, the Iraqi Army in the Kuwait Theater of Operations (KTO), including the Republican Guards, was routed and incapable of coordinated resistance. Iraqi forces were fleeing from Kuwait or surrendering to Coalition forces in large numbers. In 43 days, culminating in 100 hours of ground combat, the Coalition had shattered the fourth largest army in the world. The victory testified to the capabilities of the men and women who waged the ground operation and to the overall flexibility and effectiveness of the US military.

CINCCENT has said that several factors influenced his belief as to when the Offensive Ground Campaign should begin. These factors included force deployments and planning, logistics buildup, weather forecasts favorable for ground offensive operations, cohesion of the Coalition, and attack preparations, along with the air campaign. All were important in reducing risks and enhancing the probability of success with limited losses. While precise measurement of force ratios was not possible, senior commanders considered that Iraqi combat effectiveness needed to be reduced by about half before the ground offensive began. Combat effectiveness included both measures such as numbers of soldiers, tanks, armored personnel carriers, and artillery (and degradation thereof) as well as less measurable factors such as morale. Once air operations began, Iraqi reactions could be analyzed to provide further evidence on their military capability. For example, the Iraqi failure at Khafji indicated an inability to orchestrate the sorts of complex operations needed for a mobile defense. Further, the battle seemed to indicate a decline in the will of Iraqi soldiers while at the same time it provided a great boost in morale and confidence among Coalition Arab forces.

While Coalition air forces relentlessly pounded Iraqi defenses, Coalition ground forces completed combat preparations. They clandestinely repositioned from defensive sectors in eastern Saudi Arabia to forward assembly areas farther west. In positioning forces and supplies for the ground attack, logisticians and movement planners faced many challenges. The Coalition moved the equivalent of 17 divisions laterally hundreds of miles over a very limited road network. The trucks used for this movement were mobilized from US units, purchased and leased from US firms, donated or procured from foreign countries, and supplied by Saudi Arabia as host nation support (HNS). The move continued 24 hours a day for two weeks under the air campaign's cover. Forward logistics bases were established to support the ground offensive. This involved moving thousands of tons of supplies – food, water, fuel, ammunition, spare parts – on the same constrained road network used to move combat forces. This repositioning and logistical build up, completed on schedule and undetected by Iraqi forces, was vital to success.

At the same time, ground combat forces focused on battle preparation. Plans were refined, completed, issued, and rehearsed. The rehearsals were

particularly important since much of the initial effort involved breaching extensive Iraqi minefields, obstacles, and fortifications – operations that required close coordination.

Meanwhile, ground forces conducted reconnaissance to prepare the battlefield for the ground attack and counter-reconnaissance to deny Iraq crucial information about Coalition ground forces' dispositions. Army and Marine forces conducted helicopter raids and armed aerial reconnaissance missions into Iraq and Kuwait. The Coalition used laser-guided artillery rounds, Hellfire missiles, and the Army Tactical Missile System (ATACMS) to strike headquarters, conduct counter-battery fire, and suppress air defense. Indirect fire units focused on destroying the command, control, communications, intelligence and fire support capabilities of the first-echelon Iraqi divisions. Artillery raids caused forward Iraqi artillery to fire counter battery missions, allowing US radar to pinpoint the positions and then destroy them with multiple launch rocket systems, other artillery, and air attacks. Scout and attack helicopters, flying at night, identified Iraqi positions and engaged enemy observation posts.

This chapter discusses the planning and execution of Phase IV of the theater campaign – the Offensive Ground Campaign. It addresses the planning process, the operational considerations, and reasons for certain decisions. Next, it discusses the buildup of ground forces, battlefield preparations, logistics considerations, and intelligence requirements. An assessment of the enemy just before G-Day follows to set the stage for the ground offensive.

A detailed narrative describes the intensity of ground combat, the firepower and rapid maneuver of US ground forces, and the integration of joint and combined forces to attain the theater objectives. The chapter concludes with a summary of the accomplishments, shortcomings, and issues.

PLANNING THE GROUND OFFENSIVE

Initial Planning Cell

As early as 25 August, Commander-in-Chief, Central Command (CINCCENT) outlined a four-phased campaign ending with a ground offensive to drive Iraqi forces from Kuwait. At CINCCENT's request, in mid-September the Army assembled a group of officers to form the Central Command J5-Special Planning Group (CCJ5-SPG). CINCCENT chartered this group, graduates of the Army School of Advanced Military Studies (SAMS), Fort Leavenworth, KS, to develop courses of action for the ground offensive. A product of post-Vietnam military education improvements, SAMS provides a year of concentrated study of the theory and practice of warfare at the operational level (corps and above) and campaign planning. Because of this focus, CINCCENT requested SAMS graduates for his planning staff. The instruction at

SAMS also is guided by the Army's AirLand Battle doctrine, which is compatible with other service doctrine, particularly Marine maneuver warfare. Therefore, the cell shared a common educational background and used the precepts of AirLand Battle as the basis for their planning.

The ground operations plan was developed from an integrated joint and combined campaign plan. CINCCENT chose to retain the function of land force commander over Army and Marine ground forces, although these component commanders had a major role in refining CINCCENT's concept of operations. The Central Command (CENTCOM) Plans and Policy Directorate and Combat Analysis Group, augmented by the SAMS graduates, had primary responsibility for developing and analyzing courses of action for the overall ground offensive plan. Meanwhile, ARCENT and the Marine components, Central Command (MARCENT) had responsibility for developing and analyzing courses of action to implement the Theater Campaign Plan.

The ground forces' responsibilities (particularly Army Component, Central Command (ARCENT)), did not end with the cease-fire. Tasks such as post-war reconstruction, re-establishment of civil authority, and caring for refugees, displaced persons, enemy prisoners of war, and repatriated friendly prisoners of war remained. This planning and preparation had to be accomplished concurrent with the planning for combat operations and required substantial resources and effort.

The Planning Process

As previously discussed in Chapter 5, Transition to the Offensive, planning for the ground operation was evolutionary. Initially, planning for ground and air operations was unilateral and highly compartmented. This was due to political sensitivities and security concerns regarding an offensive campaign. After the President's November decision to deploy additional forces, ARCENT was assigned the lead for planning the ground offensive. ARCENT commanded most US Army units in theater and exercised tactical control over selected non-US coalition forces. ARCENT focused primarily on the Army's joint and combined coordination role. At the same time, CINCCENT began to develop a combined Operation Desert Storm Operations Plan (OPLAN), integrating the Coalition's full combat capability. As the overall land component commander, CINCCENT provided a focal point for the combined planning of the Coalition. UK, Egyptian and French representatives augmented the existing US-Saudi combined planning team during this period.

CINCCENT initially instructed the planners to develop an Offensive Ground Campaign using the forces available in theater at the time: one corps of two heavy, one airborne, and one air assault division; an armored cavalry regiment (ACR), and a combat aviation brigade (CAB); a Marine Expeditionary Force (MEF) ashore along the coast and a Marine Expeditionary Brigade (MEB) afloat in the Gulf; and other Coalition forces.

Operational Imperatives

Planners had reached several significant conclusions that were designated as operational imperatives and would remain as central planning tenets throughout planning for the offensive. The planners concluded that for the ground campaign to be successful, the air campaign would have to reduce Iraqi combat effectiveness in the Kuwait Theater of Operations by about half. A second operational imperative was that Coalition ground forces should fight only those enemy units necessary to achieve Coalition objectives while bypassing other enemy forces. The third operational imperative was that battlefield tactical intelligence would be required in the hands of battlefield commanders so rapidly that fire power could be placed on target before the target could move sufficiently to require retargeting. It was felt that this tactical intelligence-targeting feedback loop would be critical to success on the battlefield.

Development of Courses of Action

The planning cell briefed their courses of action and recommendation to CINCCENT on 6 October. The preferred course of action called for a one corps frontal attack directly into Kuwait from Saudi Arabia. The objective for this attack was an area of high ground north of the Mutla Pass and Ridge. The risk with this plan was that the attack would encounter major portions of the enemy's strength and operations to breach Iraqi defenses might be extremely difficult. CINCCENT judged that while such an attack probably would succeed, casualties could be sizable, and the Republican Guards, one of Iraq's centers of gravity, might escape. To avoid the enemy's main defensive positions, a wider, deeper envelopment with additional forces was required.

On 11 October, the CENTCOM chief of staff briefed the Chairman of the Joint Chiefs of Staff (CJCS), the Secretary of Defense, and the President. The CENTCOM chief of staff stressed that, although the US ground forces could attack, success could not be guaranteed because of the existing balance of forces. Additional risks included extended supply lines, the lack of an armored force in theater reserve, and the threat of chemical warfare.

Based on guidance from the Secretary, CINCCENT subsequently directed his planning staff to consider an envelopment by two US Army corps west of the Wadi Al-Batin. The purpose of the envelopment was to get behind the main Iraqi forces while supporting attacks were conducted by other Coalition forces into Kuwait. The main attack's objective was the destruction of the Republican Guards forces.

The CJCS was briefed on this concept on 22 October. Following the briefing, his guidance to CINCCENT was straightforward. "Tell me what you need for assets. We will not do this halfway. The entire United States military is available to support

this operation.” The conclusion was that a second Army corps, initially two divisions and an ACR, should provide the necessary forces to carry out the maneuver to the west, around the Iraqi main defenses. The CJCS agreed to seek approval for deployment of the additional force. VII Corps, based in Germany, was a logical choice for deployment because of its proximity to the theater, high level of training, and modern equipment. VII Corps began its movement immediately after the President’s 8 November announcement.

In addition to the European-based corps, other forces were required. At ARCENT’s request a third division, the Army’s 1st Infantry Division from Fort Riley, KS, was added to give VII Corps more capability. MARCENT saw the need for an additional division and reinforcement of the 3rd Marine Aircraft Wing (MAW) in order to conduct effective supporting attacks. These forces would let the Marines breach the Kuwait border defenses and defeat the 11 Iraqi divisions thought to be in eastern Kuwait. Planning also continued for an amphibious assault along the Kuwaiti coast to flank Iraqi defenders on the Kuwaiti border. Although the amphibious assault was not conducted, it became an integral part of the theater deception plan, which was intended to portray a Coalition main attack along Kuwait’s southern border. To satisfy the requirement for additional forces, elements of II MEF, to include the 2nd Marine Division (MARDIV), a large part of the 2nd MAW, 2nd Force Service Support Group (FSSG), and the 5th MEB were deployed from the Continental US (CONUS).

Issues and Concerns Regarding the Plan

Several concerns were raised during the plan’s final development. These included:

- What arrangements could be made for effective command and control (C2) of Coalition forces?
- What was the trafficability for heavy vehicles in the area of operations?
- Was the concept of operations logistically supportable and feasible?
- Could the Coalition penetrate Iraq’s defensive belts and formidable obstacles?

In addition, there was the crucial question of the overall size of the Iraqi force that would be deployed to defend the KTO.

CINCCENT's Strategy and Concept

On 14 November, CINCCENT briefed his concept for the operation to all his ground commanders down to division level. XVIII Airborne Corps was to be used in the west. VII Corps would be the main effort and would destroy the RGFC in the KTO. British forces would remain with MARCENT (a decision later reversed). A heavy division was to be assigned as theater reserve. Supporting attacks would be conducted by the I MEF, Joint Forces Command - North (consisting of Egyptian, Saudi, and Syrian forces) and Joint Forces Command - East (consisting of Saudi and GCC forces). Commanders were directed to have forces ready by mid-January. Figure VIII-2 describes CINCCENT's strategy and intent for the Offensive Ground Campaign.

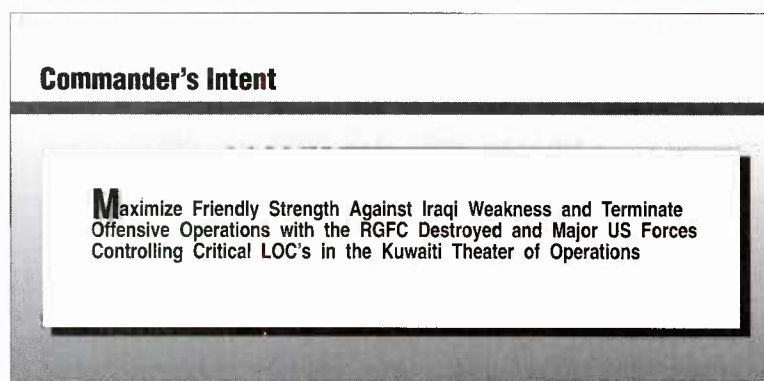


Figure VIII-2

Secretary of Defense Reviews War Plans

On 19 and 20 December, the Secretary of Defense and CJCS were provided an update on war plans in Riyadh. NCA objectives were reviewed and CENTCOM's mission was summarized. Ground offensive plans were summarized by phases of preparation and operations. The logistics buildup, which would be initiated when the air campaign started, would take two weeks and similarly, force repositioning to attack positions would consume two weeks. The actual ground offensive was estimated to take up to two weeks, followed by a period of consolidation that would last up to four weeks. Subsequent logistics buildup and force repositioning would occur simultaneously. The commander's intentions were presented. Victory would be achieved through the destruction of the RGFC in the KTO, preservation of the offensive capability of the combined forces, and restoration of the sovereignty of Kuwait. Attacking ground forces were to penetrate and bypass static Iraqi defensive forces which included infantry and other forces that were not mobile and could not pose a threat to a fast moving Coalition armor forces. It was CINCCENT's intention to physically and psychologically isolate the Iraqi forces in Kuwait. Operations would fix and block Iraq's first operational echelon reserves, with the

objective of securing Coalition flanks and LOCs. Ground operations would culminate in the destruction of RGFC divisions in the KTO.

The Secretary of Defense approved CINCCENT's plan. Upon his return to Washington, he and the CJCS briefed the President who also approved the plan. However, it was determined that the actual start of the ground campaign would require a subsequent Presidential decision, which was made in February.

Ground Campaign Phases

The planning process continued within CINCCENT's general parameters. When Operation Desert Storm OPLAN was issued, it directed the ground campaign part of the theater campaign be conducted in four phases:

- Phase I - Logistical buildup;
- Phase II - Force repositioning;
- Phase III - Ground attack; and
- Phase IV - Tactical consolidation.

PREPARATION FOR THE OFFENSIVE

Ground Forces Buildup

The first US ground forces, lead elements of the 82nd Airborne Division, arrived in theater on 9 August. Figure VIII-4 shows the buildup, by brigades, of US ground forces within the theater. By early December, approximately half of the US combat brigades had arrived. Within 40 days, most of the remaining forces had arrived. By the end of January, the ground forces in theater could conduct the type of offensive operations envisioned by CINCCENT. However, some VII Corps units literally moved directly from the ports into their tactical assembly areas (TAA) and forward attack positions the day before the ground offensive began.

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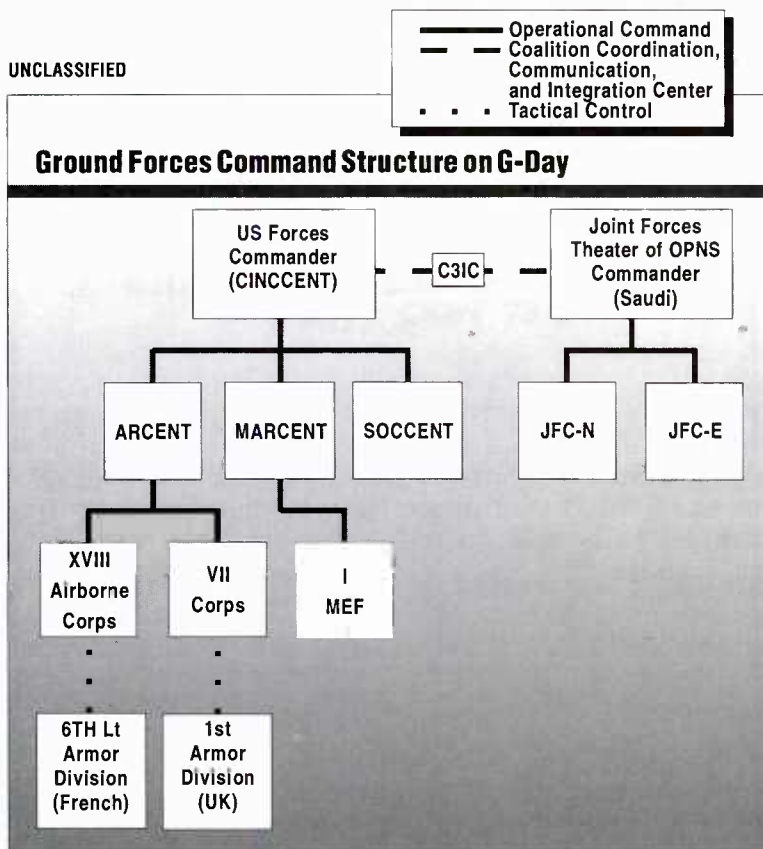


Figure VIII-3

Task Organization (US Ground Forces)

Coalition ground forces were task organized along corps lines to improve C2 and in accordance with the ground operation mission (Figure VIII-5). ARCENT provided C2 to Army forces in the theater (Figure VIII-6).

I MEF had two reinforced infantry divisions and the 3rd MAW with 222 fixed-wing aircraft and 183 helicopters. Its combat power greatly exceeded that normally found in a MEF. In addition, I MEF could call on 20 AV-8Bs and 141 helicopters afloat in the Gulf with 4th and 5th MEBs.

The 1st MARDIV, composed of units from all three active MEFs plus Reservists, deployed during the early stages of Operation Desert Shield. To build esprit among the many units assigned to 1st MARDIV, it was divided into task forces, each organized and equipped for specific missions and bearing a unique title.

A US Army Division, totalling approximately 17,500 soldiers, is organized from a common division base that consists of a division headquarters, three maneuver brigades, an aviation brigade, an artillery brigade, an air defense artillery battalion, an engineer battalion, a signal battalion, a military intelligence battalion, a military police company, a chemical company, and a support command. The heavy divisions that served in Operation Desert Storm each consisted of a mix of 10 armor and mechanized infantry battalions along with necessary combat support and combat service support units.

A US Marine Division is normally organized around three infantry regiments of three battalions, an artillery regiment, and separate tank, light armored vehicle, reconnaissance, assault amphibian vehicle, and combat engineer battalions, totalling approximately 20,000 Marines. During combat, the Division may be reinforced with additional infantry or mechanized units, as occurred during Desert Storm. Infantry regiments are also task organized for combat, usually consisting of two to four infantry battalions along with necessary combat support and combat service support units to enable them to accomplish their missions.

Coalition divisions, on the other hand, are less easy to define, reflecting as they do the broad differences of culture, national security requirements, and military tradition from which they are derived. Some are modeled on European analogues, some on US, some on Soviet, and some on historical influences unique to their country. For example, the 1st British Armoured Division, reinforced for the conflict like many US divisions, numbered some 28,000 troops. Some other divisions were much smaller.

The 2nd MARDIV deployed in December, minus the 2nd Marine Regiment (Reinforced) afloat with 4th MEB; it also was augmented with Reserves. It retained its traditional regimental titles although it also was task organized. The 2nd MARDIV was given the 1st (Tiger) Brigade, 2nd Armored Division with M1A1 tanks and M2/M3 fighting vehicles, to serve as an exploitation or counterattack force.

Special Operations Forces (SOF) included Army Special Forces (SF) and Army Special Operations Aviation units; Navy SEALs and Special Boat Units; Air Force (USAF) Special Operations squadrons and Special Operations Combat Control Teams; and Psychological Operations (PSYOP) and Civil Affairs (CA) units. A Joint Special Operations Task Force controlled reconnaissance, special reconnaissance (SR), and direct action operations to support battlefield preparation.

SOF teams were attached to non-US Coalition units down to battalion level; their presence increased commanders' confidence. These teams assessed Coalition

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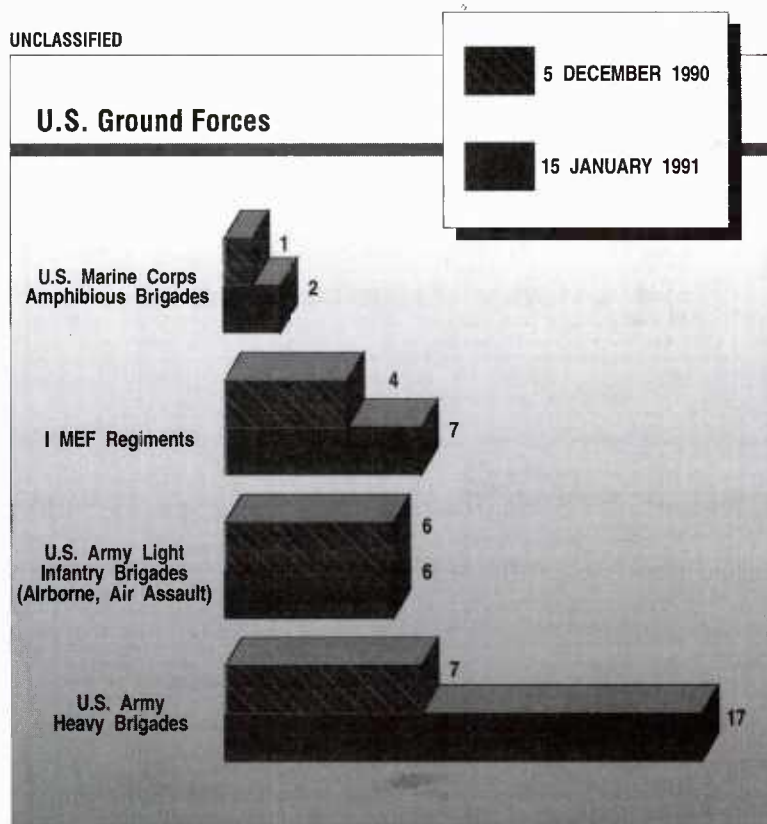


Figure VIII-4

forces' readiness levels, provided training and communication capability, coordinated tactical operations, assisted with fire support coordination, and provided information CINCCENT needed to ensure effective operational coordination with Coalition forces. (SOF organizations and operations are further discussed in Appendix J.)

Task Organization (Non-US Ground Forces)

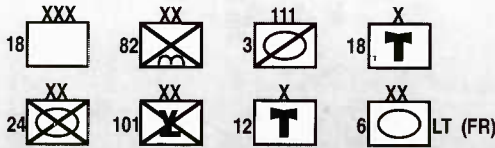
Arab-Islamic ground forces were organized in two corps, the Joint Forces Command-North (JFC-N) and Joint Forces Command-East (JFC-E). Ground forces in JFC-N and JFC-E represented 14 countries. Figures VIII-8 and VIII-9 depict the JFC-N and JFC-E task organization. Figure VIII-10 shows UK, French, and Kuwaiti ground forces.

Task Organization

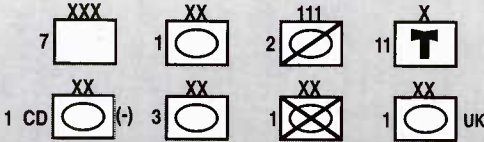
ARCENT



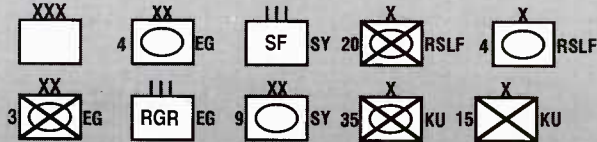
XVIII AIRBORNE CORPS



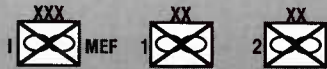
VII CORPS



JFC - N



MARCENT



JFC-E



Figure VIII-5

MAJOR ARMY FORCES

Organization for Combat

ARCENT

11th ADA BDE

XVIII AIRBORNE CORPS

82d Airborne Division (-)

101st Airborne Division (AASLT)

24th Infantry Division (MECH)

197th Infantry Brigade (MECH)

3d ACR

12th AVN BDE

18th AVN BDE

XVIII Corps Artillery

18th FA BDE

212th FA BDE

196th FA BDE

6th Light Armored Division (FR) (TACON)

2d BDE, 82d Airborne Division (OPCON)

VII CORPS

1st Armored Division

3d BDE, 3d Infantry Division

3d Armored Division

1st Infantry Division (MECH)

2d Armored Division (FWD)

1st Cavalry Division (-)

2d ACR

11th AVN BDE

VII Corps Artillery

210th FA BDE

42d FA BDE

75th FA BDE

142d FA BDE

1st AR Division (UK) (TACON)

SOCCENT CONTROL

5th Special Forces Group

3d Special Forces Group (-)

MARCENT CONTROL

1st BDE, 2d Armored Division

Figure VIII-6

I MEF Task Organization

I MEF Command Element

- 1st Surveillance, Reconnaissance, and Intelligence Group
- 3d Civil Affairs Group
- 3d Naval Construction Regiment (USN)
- 24th Marines (USMCR) (Rear Area Security)

1st Marine Division

- 1st Marines (TF Papa Bear)
- 3d Marines (TF Taro)
- 4th Marines (TF Grizzly)
- 7th Marines (TF Ripper)
- 11th Marines (TF King)
- 1st Light Armored Infantry Battalion (TF Shepherd)
- 1st Battalion, 25th Marines (USMCR) (TF Warden)
- TF Troy (Deception)
- (1st and 3d Tank Battalions, 1st Combat Engineer Battalion, 1st Reconnaissance Battalion, and other combat support units were attached to the task forces)

2d Marine Division

- 6th Marines
- 8th Marines
- Tiger Brigade, 2d Armored Division (USA)
- 10th Marines
- 2d Light Armored Infantry Battalion
- 2d Tank Battalion (M1A1)
- 8th Tank Battalion (USMCR) (M60A1)
- 2d Reconnaissance Battalion

3d Marine Aircraft Wing

- Marine Aircraft Group-11
- Marine Aircraft Group-13 (Forward)
- Marine Aircraft Group-16
- Marine Aircraft Group-26
- Marine Air Control Group-38
- Marine Wing Support Group-37

1st Force Service Support Group

- General Support Group-1
- General Support Group-2
- Direct Support Command
 - Direct Support Group-1
 - Direct Support Group-2

5th Marine Expeditionary Brigade

- 5th Marines
- Marine Aircraft Group 50 (Composite)
- Brigade Service Support Group-5

Figure VIII-7

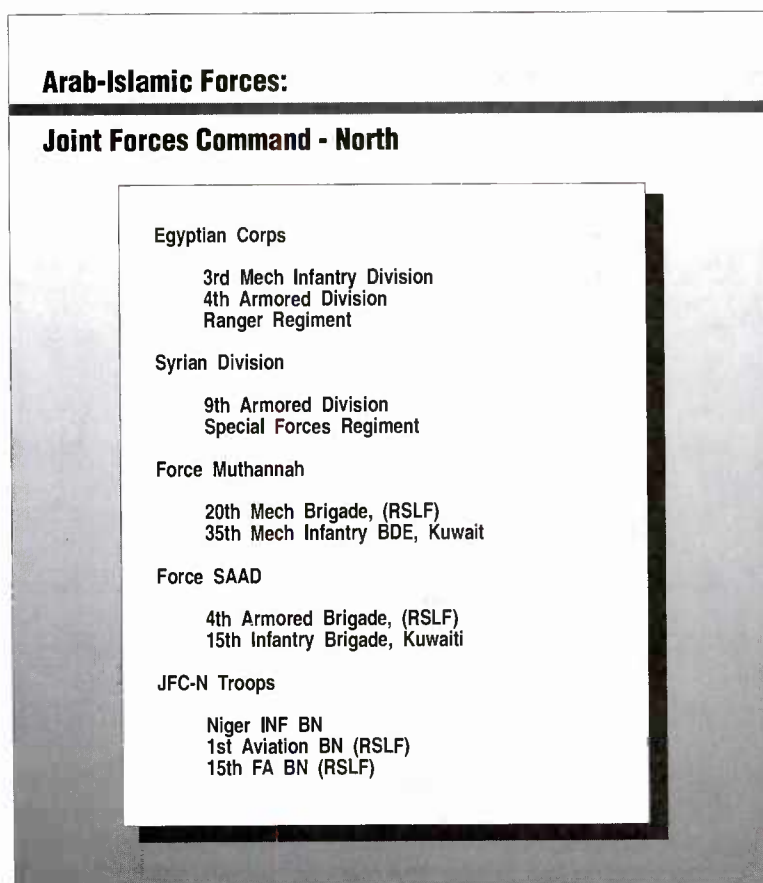


Figure VIII-8

Command, Control, and Communications

Coalition Coordination, Communication, and Integration Center (C3IC)

The Gulf War presented unique challenges in developing Coalition C2 relationships and assigning missions. Faced with the diversity of forces from more than 23 nations, often with unique doctrine, language, customs, religion, equipment, and capabilities, CINCCENT was aware of the operational contradictions that threatened the Coalition's vitality. Political considerations, national pride, and public perceptions could, in some instances, complicate military requirements.

To harmonize Coalition forces actions and achieve unity of effort (especially with respect to land forces), CINCCENT, ARCENT, and Saudi military leaders created the Coalition Coordination, Communication, and Integration Center (C3IC). ARCENT and the Saudi Arabian Armed Forces (SAAF), initially operated the C3IC. The C3IC

Arab-Islamic Forces:

Joint Forces Command - East

Force Abu Bakr

2nd SANG Brigade

Force Othman

8th Mech Brigade (RSLF)
Kuwait Al-Fatah Brigade
Oman Motorized Infantry Battalion
Bahrain Infantry Company

Task Force Omar

10th Mech Brigade (RSLF)
UAE Motorized Infantry Battalion

Task Force Tariq

Marine Battalion Task Force (RS Marines)
Infantry Battalion (Senegal)
6th Mech Infantry Regiment (Moroccan Forces)

JFC-E Troops

Qatar Mech Infantry Battalion
1st East Bengal INF BN
Combat Aviation Battalion (Kuwait/UAE)
14th FA BN (Towed, 155) (RSLF)
18th FA BN (MLRS) (RSLF)
Engineer Force 5 Saif Allah (RSLF)

Figure VIII-9

gave ARCENT and the SAAF the ability to bring Coalition forces together to coordinate tasks and missions. In December, responsibility for the US operation of the center transferred to the CENTCOM staff. The C3IC did not command; it integrated the Coalition land forces into one solid effort, receiving reports, collecting data, improving the information flow, and harmonizing operational planning in areas such as host nation support, movement control, and training. The C3IC was the combined operations cornerstone, helping meld the Coalition into an effective combat force. The planning process, involving C3IC members, did much to help form and hold the Coalition together. In addition, the scope of the operation, movement of forces across great distances, and the forces' political and cultural complexion demanded innovative techniques and hard work at all levels to ensure battlefield success. Further information on the C3IC is in Appendix K.



Figure VIII-10

Liaison Teams

Liaison teams from ARCENT, SOF, USAF Forward Air Controllers (FACs), Air Liaison Officers (ALO), and Air Naval Gunfire Liaison Company (ANGLICO) Marines also were key to coordination and control. Service warfighting doctrine requires liaison teams between flanking units, from higher to lower Headquarters, among components and among Coalition forces. For example, ARCENT liaison teams with substantial communications capabilities were sent to the two Army corps and I MEF.

Liaison teams also were attached to other Coalition forces. ARCENT teams attached to JFC-N and JFC-E averaged 35 soldiers and became battle staff members, helping plan offensive operations and easing coordination with higher and adjacent units. These teams were equipped with satellite communications (SATCOM) packages that allowed them to communicate directly with ARCENT and CENTCOM headquarters. They became the eyes and ears of the ARCENT commander and CINCCENT, and provided an accurate battlefield picture in the non-US Coalition sectors as offensive operations progressed. These liaison teams were crucial to the synchronization, coordination and control of the combined battle.

Coordination and Control Measures

Coordination and control on a battlefield of this magnitude requires extensive measures, not only to permit joint and combined operations and synchronize the combat power of the multinational effort, but also to increase Coalition forces' safety. Commanders were concerned about casualties from friendly fire from the beginning and took account of this danger in formulating their operational plans. It is almost impossible, however, to prevent casualties from friendly fires, given the speed of operations, lethality of weapons and the environmental conditions under which the war was fought. (Friendly fire incidents are discussed in Appendix M.)

Every level from company to theater used extensive coordination and control measures. Boundaries between units, phase lines to coordinate advances, fire support coordination lines (FSCL), and restricted fire lines were among the measures used. For the most part, these measures are found in doctrine or standard operating procedures. During the offensive, additional procedures were developed to meet specific needs for additional coordination.

Communications

To support Operation Desert Storm, CENTCOM created the largest theater communications system in history. It connected US sustaining bases, CENTCOM, Coalition forces, and subordinate elements. Because the system expanded rapidly, communications frequency management and asset availability became crucial. Providing reliable and continuous command, control and communications with a rapidly moving force across vast distances during the ground war raised a whole new set of challenges.

To meet the needs of field commanders, multichannel SATCOM was used. These systems required detailed frequency management and constant attention. There were 115 super high frequency (SHF) tactical satellite (TACSAT) ground terminal relocations during the Offensive Ground Campaign, with 33 multichannel satellite terminals in Iraq and Kuwait at the end of the operation. Planning and executing these satellite terminals' movement to support the ground offensive was a major challenge. Signal units frequently displaced nodes and terminals to maintain and sustain communications for advancing units.

Because of the distances between units, deploying units augmented their organic equipment with ultra high frequency (UHF) TACSAT ground terminals. UHF single channel TACSAT terminals were used for C2, intelligence dissemination and logistics support. The need for this capability across long distances was identified early; the requirement increased steadily throughout the operation. (More detailed discussion of C3I is in Appendix K.)

Joint and Combined Operations

Common Warfighting Doctrine

Evolving joint operations doctrine guided the planning and conduct of the ground offensive. The basic principles of initiative, depth, agility, synchronization and combined arms are understood and practiced by all Services. Forces are trained to fight using common principles and techniques to ensure battlefield interoperability. Each Service, however, has developed its own doctrinal concepts, operational principles, and internal organizational and tactical concepts to maximize capabilities. For example, USMC warfighting doctrine is based on many of the same principles as Army AirLand Battle doctrine, but it is adapted to the USMC organization and structure. Technical terminology and procedures are being standardized at the joint level. These include common maneuver and fire support control measures, air support procedures, and operational planning and reporting formats.

AirLand Battle Doctrine

The basis for ARCENT operations was AirLand Battle doctrine. The essence of AirLand Battle is to defeat the enemy by conducting simultaneous offensive operations over the full breadth and depth of the battlefield. It is the intellectual road map for operations, conducted at corps and above, and tactics, conducted below corps. This doctrine places tremendous demands on combat leaders. Commanders must fight concurrently what are known as close, deep, and rear operations, all as interrelated parts of one battle. Commanders fight close – to destroy enemy forces where the battle is joined. They fight deep – to delay or attack enemy reserves. These operations are intended to disrupt the enemy's plan and create opportunities for success in close operations. They fight rear, behind forward units, to protect CSS assets and to retain freedom of action for friendly sustainment and movement of reserve forces.

AirLand Battle doctrine is centered on the combined arms team, fully integrating the capabilities of all land, sea and air combat systems, and envisions rapidly shifting and concentrating decisive combat power, both fire and maneuver, at the proper time and place on the battlefield.

Ultimately, success on the AirLand battlefield is predicated on four basic tenets:

- Initiative – to set or change the terms of battle by offensive action;

- Agility – the ability of friendly forces to act mentally and physically faster than the enemy;
- Depth – the extension of operations in space, time, and resources; and,
- Synchronization – the arrangement of battlefield activities in time, space, and purpose to produce maximum relative combat power at the decisive point.

Marine Air-Ground Task Force Doctrine

Marine Air-Ground Task Force (MAGTF) doctrine guided I MEF as it planned and executed its part of Operation Desert Storm. Seeking to unhinge the enemy's cohesion, Marine forces exploited enemy vulnerabilities while maximizing their own strengths. Initiative, flexibility, and combined arms synchronization were keys to battlefield success, and to fully achieve these principles, the MAGTF concept was stressed. Task-organized for specific missions, the MAGTF is a balanced air-ground-logistics team composed of four elements – the command element, the ground combat element (GCE), the aviation combat element (ACE), and the CSS element. These elements fall under one commander, who can fight a three-dimensional battle at both the tactical and operational levels.

Central to MAGTF doctrine is the close integration of ground and air combat elements. Trained to work in close cooperation, this is more than a relationship in which aircraft provide close support to ground forces, although that is a key element. The GCE, task organized to accomplish its mission, can range from a light infantry force to a mechanized combined arms task force. Common warfighting doctrine and training lets units from different parent commands or geographic locations be meshed quickly into a fighting team (as occurred in the 1st MARDIV in Operation Desert Shield). The GCE, however, is only one MAGTF maneuver element. The ACE, with fighter, attack, and rotary wing aircraft, extends the battlefield and operates in the enemy's rear areas, seeking to inflict extensive damage and disruption before ground forces clash. During the ground battle, Marine aircraft ranged throughout the battle area, under the MAGTF commander's control, providing close air support (CAS) to ground forces and interdiction of enemy forces throughout the depth of the MAGTF AOR.

Air Operations in Support of the Ground Offensive

In CINCCENT's theater campaign plan, elimination of strategic targets and attrition of Iraqi combat effectiveness in the KTO were prerequisites for the Offensive Ground Campaign. However, many factors affected this plan and the realignment of air targeting priorities to support CINCCENT's objectives. These

included: the air defense threat; the need to find and strike Scud missile launcher locations; the deception plan, which placed the weight of battlefield preparation initially in the MARCENT and JFC-N zone; ranges and capabilities of some airframes, which were not suited for certain types of missions; and an unusually long period of poor weather and low visibility.

Because the ground offensive's start was predicated on reduction of Iraqi forces in the KTO, the ground force commanders were directly involved in battle damage assessment and provided assessments to CENTCOM. CINCCENT's desired level of attrition was approximately half of the Iraqi combat effectiveness. Ground forces and supporting air assets closely coordinated the targeting effort to achieve the required attrition levels.

Army aviation operations during the ground offensive were an integral part of the ground commanders' scheme of maneuver. In addition to the traditional missions of attack, assault, armed reconnaissance, intelligence gathering, and C2, non-traditional missions, such as counter-battery and counter-reconnaissance missions, were flown. Cooperative planning between fire support units and other air assets capitalized on the strengths of both systems.

I MEF relied on 3rd MAW assets. Trained to operate with Marine ground forces, 3rd MAW provided I MEF with an important combat multiplier, letting I MEF conduct an integrated air-ground operation that included not only the increased firepower of CAS, but also the ability to prepare the battlefield and to attack enemy forces throughout its zone. 3rd MAW, in effect, acted as an additional I MEF maneuver unit, operating in concert with the MEF attack plan, but able to strike the enemy and influence the battle well forward and to the flanks of the advancing ground forces.

Naval Operations in Support of the Ground Offensive

While Coalition naval forces continued to operate in the Red and Northern Arabian seas, primary support to the ground offensive was provided by forces in the Persian Gulf. This support included an amphibious task force, two battleships and two carrier battle forces, as well as escorts, smaller vessels and minesweepers from both the United States and several other Coalition nations. The primary focus of naval support for the ground offensive was an amphibious assault on the Kuwait coast.

Naval forces in the Gulf also conducted several other missions to support the ground offensive. The battleships *USS Missouri* (BB 63) and *USS Wisconsin* (BB 64) bombarded Iraqi coastal positions, and later provided naval gunfire support (NGFS) to advancing Coalition units. Naval aircraft destroyed Iraqi naval forces based in Kuwait and Al-Faw and conducted bombing attacks, which helped prepare the battlefield. Beginning in late January, SEALs conducted coastal reconnaissance.

Finally, maritime forces ensured the continued flow of supplies and equipment to the Gulf coast ports, enabling the VII Corps and additional Marine forces to arrive. A detailed discussion of naval operations is in Chapter VII.

Roles of Non-US Coalition Forces

The various Coalition forces each had different abilities. The theater plans considered these differences and assigned roles and missions to achieve the best results. Final assignments of Arab-Islamic forces were coordinated between CINCCENT and Commander, Joint Forces/Theater of Operations. These missions considered the Arab-Islamic forces' relative capabilities, tactical mobility, and logistics supportability.

As the plan developed, CINCCENT redistributed missions. The 6th French Light Armored Division was placed under XVIII Airborne Corps tactical control (TACON); it was used to secure the theater's left flank. With the arrival of the remainder of the 1st UK Armoured Division from Germany, the 7th UK Armoured Brigade, attached to MARCENT, reverted to its parent unit. The 1st UK Armoured Division was placed under VII Corps TACON. To compensate for this loss in MARCENT's armor capability, the 1st (Tiger) Brigade, 2nd Armored Division was detached from the 1st Cavalry Division and attached to MARCENT.

Tactical Intelligence

Ground commanders at corps and below required as much information as possible about Iraqi forces and defensive positions, particularly along the Kuwait-Iraq border, where extensive minefields, complex obstacles, and interlocking defenses had to be breached. Deception and operations security (OPSEC) requirements precluded those same commanders from conducting intelligence collection operations to the depth of their respective areas of interest. As a result, the echelons above corps intelligence systems and organizations were tasked to provide detailed intelligence support to tactical commanders. At the same time, those sensors and organizations were expected to continue to provide intelligence support to other areas of vital US interests.

Competition for scarce and capable resources was intense and resulted in situations where requirements were not validated or were included in higher headquarters taskings. Sensors (particularly imagery) were unavailable or were incapable of being reoriented on short notice, and national-level analysts did not respond in the detail ground tactical commanders required.

Overall, intelligence organizations attempted to apply innovative solutions to difficult problems. Intelligence provided to ground tactical commanders from the theater and national levels was not always timely and often came in unfamiliar formats. In confronting these difficulties, commanders often generated additional requests for information which, in turn, further taxed the overburdened theater and national intelligence systems. Consequently, ground tactical commanders were not confident with the tactical intelligence picture as G-Day approached. (A detailed discussion of tactical intelligence is in Appendix C.)

Logistics

From the first day of Operation Desert Shield, the logistical effort was a major priority. Committed to a theater of operations without a broad, well-developed logistics infrastructure or transportation network, and lacking established alliance support relationships, US forces had to create these capabilities in the midst of a massive deployment, with the prospect of imminent combat.

Saudi air and sea ports are modern, sophisticated and complex, rivaling those of Europe and the Pacific in terms of capacity and capability. Major coastal roads and road systems around principal Saudi cities were also excellent. These provided a foundation which was critical to the overall effort. In contrast, the meager inland transportation system dictated a major road building effort and field logistics infrastructure development.

The ability to support and sustain the force was perhaps the most crucial operational consideration as CINCCENT planned the theater offensive. Massive logistics assets would have to be in place to support the ground offensive. Accordingly, two contingency plans were developed. The first was to shorten the LOC by building roads following the attacking corps. The second was a logistics over the shore operation, if a port in Kuwait could be made available. A base along the Kuwaiti coast, at Ash Shuaybah or farther north, would shorten logistics lines by hundreds of miles and enable supplies to be carried by sea from main bases in Al-Jubayl and Ad-Dammam.

Plan For Sustainment

The forces to be supported for the ground offensive were sizable. ARCENT, British, and French forces totaled 258,701 soldiers, 11,277 tracked vehicles, 47,449 wheeled vehicles, and 1,619 aircraft. In accordance with joint doctrine and agreements, ARCENT also retained responsibility for much of the theater logistics support of Air Force Component, Central Command (CENTAF) and MARCENT. In preparation for G-Day, 29.6 million meals, 36 million gallons of fuel, and 114.9

thousand tons of ammunition were moved from the port to forward positions west of Wadi Al-Batin. These supplies had to be moved in a very short period; however, to preserve security, logistics bases could not be set up west of the Wadi Al-Batin before air operations began.

The plan for logistical support and sustainment envisioned moving all classes of supplies, but especially fuel, ammunition, food, and water, forward to the ground forces as they pushed into Iraq. The corps support commands (COSCOM) in turn received and moved these supplies and equipment forward to the appropriate division support commands (DISCOM). The DISCOM then sent these supplies to the respective forward support battalions which supported the ground maneuver forces. The plan for theater logistics sustainment further called for support to be echeloned forward to temporary logistics bases, as the battle unfolded and tactical objectives were seized. Logistics planning and sustainment below the theater level were conducted according to established doctrine.

Establishment of Logistics Bases

The establishment of logistics bases was a key feature of the plan. CSS assets were required well forward and positioned to sustain the momentum of the attack once the ground offensive began. The bases had to be able to sustain the combat forces in their initial deployment areas and serve as intermediate storage areas for supplies to be moved to sites west of the Wadi Al-Batin. These sites would, in turn, support operations into Iraq and Kuwait.

ARCENT established six sites to sustain the XVIII Airborne and VII Corps. In the I MEF area, four CSS areas were set up near the Kuwait border. All forward sites were stocked with bulk potable water, both bottled and from reverse osmosis water purification units, ammunition, equipment, food, petroleum, construction materials and spare parts for delivery forward as needed. At these forward logistics sites, the components organized logistics units to support and sustain forward elements according to their assigned missions. Figure VIII-12 depicts actual and planned logistics bases before the ground offensive. Initial sustainment planning in various classes of supplies for the theater primary logistics bases are in Figure VIII-13.



Figure VIII-11
Forward Operating Logistics Base

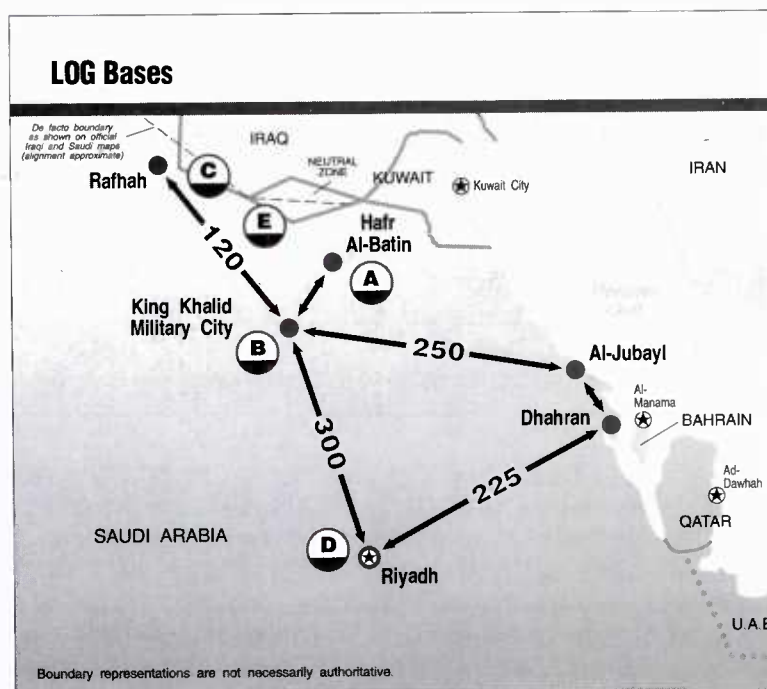


Figure VIII-12 (Distances are in Miles)

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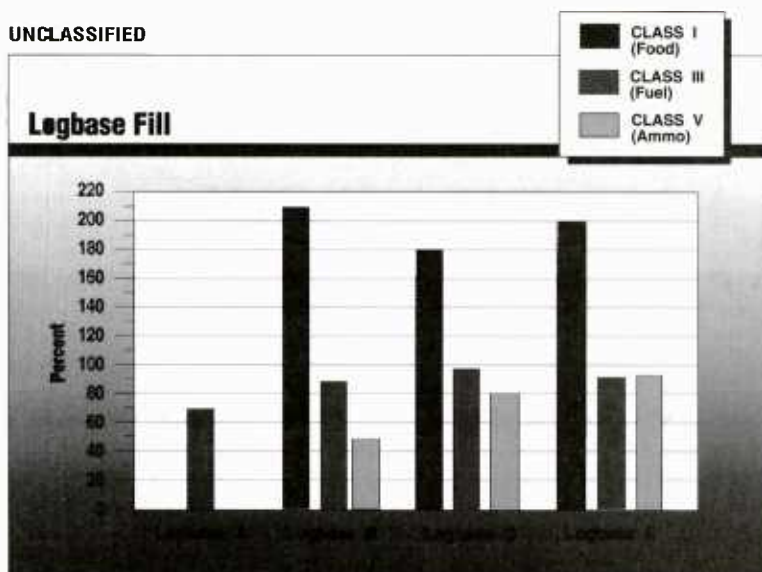


Figure VIII-13

ARCENT's 22d SUPCOM shifted vast quantities of supplies to these bases in the west. The supply bases contained enough materiel to support combat operations for up to 60 days. Some were moved several times, first to the west and then north once the operation began. Several lessons emerged from planning for this initial shift, including the fact that US forces lack sufficient heavy equipment transporters (HETs) and trucks with off-road capabilities. Just one of the five heavy divisions, the 24th Infantry Division (Mechanized), for example, needed 3,223 HET, 445 lowboys, and 509 flatbed loads to move its heavy equipment from forward assembly areas into attack positions. The problem was further complicated because units arrived at the ports at irregular intervals. While trucks could be surged to meet arriving units, the limited road space upon which to move them remained constant. The necessary trucks were obtained with other Coalition countries' help. HNS, Coalition forces' support, and support from non-traditional allies, including the former Warsaw Pact nations, were substantial and essential. Although the Army sent considerable numbers of the most modern wheeled vehicles to the theater before Operation Desert Storm, off-road truck transport remained a problem throughout the ground offensive.

The extended maneuver of US ground combat units, characterized by rapid advance and continuous operations, was successfully sustained from the established logistics bases during the offensive. The greatest challenge for CSS operators at the logistics bases and supply operators with the maneuver units was trying to manage transportation assets effectively to ensure resupply across the rapidly expanding battlefield. Keeping the combat vehicles supplied with fuel was the greatest challenge. The Heavy Expanded Mobility Tactical Truck was one of the few vehicles that could keep going when rain turned roads into a quagmire. (Appendix F includes a further discussion of heavy equipment transporters.)

Joint Logistics

In addition to supporting Army elements, ARCENT supported the other CENTCOM components. ARCENT was responsible for food, water, bulk fuel, ground munitions, port operations, inland cargo transportation, construction support for all US forces and for graves registration after a Service exceeded its own organic capability.

Support for the Tiger Brigade attached to MARCENT for the ground offensive was an excellent example of how joint logistics was managed. The USMC system is not structured to support and maintain an Army brigade equipped with M1A1 tanks and M2/M3 fighting vehicles. To meet this requirement, back-up direct support and general support was provided through a provisional forward area support company tailored from elements of the ARCENT 593rd Area Support Group and the 176th Maintenance Battalion. These elements augmented the brigade's direct support battalion and operated with the USMC 1st FSSG. The relationship between the Army forward area support operations and the USMC logistics structure provided the necessary support to the brigade.

MARCENT Logistics

CSS in the MARCENT sector was equally challenging. Organized and equipped to conduct operations relatively close to the shore, the 1st FSSG operated more than 50 miles inland and 100 miles from its main supply base at Al-Jubayl. As an innovative partial solution, Marine Reservists, primarily from the 6th Motor Transport Battalion, formed "Saudi Motors", a collection of several hundred drivers with commercial trucks provided by the Saudis to link Al-Jubayl with the forward logistics sites. Marine assault support helicopters shuttled back and forth between the rear and forward logistics sites, carrying cargo and delivering high priority items. I MEF requested and received some direct support line haul, transportation and theater level fuel support in the form of HETs, fuel tankers and other motor transport assets from 22nd SUPCOM.

To support the tactical units, 1st FSSG divided itself into general support and direct support groups, with mobile service support detachments providing support to each assault regiment or task force. This decentralized structure let 1st FSSG distribute supplies from Al-Jubayl directly to front-line units without a cumbersome intervening support organization. Each level operated to help the next element forward. Although not a part of USMC doctrine, this innovative organization of the service support structure may have been one of the more successful aspects of the ground campaign. I MEF supported its combat forces at distances far exceeding those anticipated in peacetime, and given the volumes of supplies and speed of advance, Marine logistics abilities were stretched to the limits.

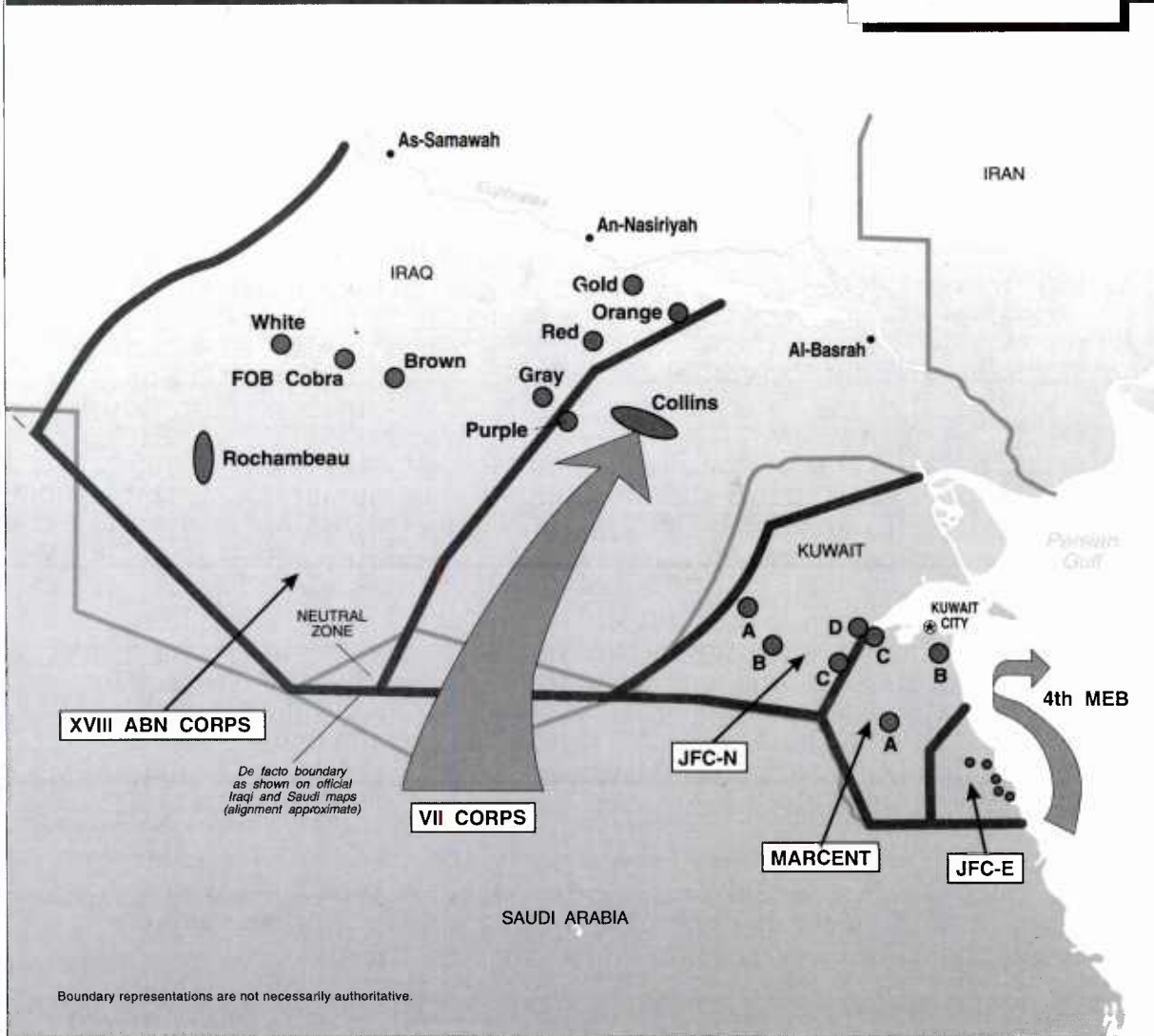
The Final Operational Plan

The final CINCCENT ground offensive plan involved several interrelated operations. ARCENT would lead the main effort. XVIII Airborne Corps would attack in the west and deep into Iraq to control the east-west LOC along Highway 8 and cut off Iraqi forces in the KTO. VII Corps would conduct the main Coalition effort, attacking east of XVIII Airborne Corps and west of Wadi Al-Batin, driving to the north and then east to destroy Republican Guard forces. VII Corps adjusted its plan by calling an "audible" during a CPX conducted 6-8 January 1991, to move two armored divisions and a cavalry regiment to the west to take advantage of a gap in the Iraqi defenses. This was made possible when the 1st Cavalry Division was made OPCON to VII Corps to prevent a Khafji-type attack by Iraqi forces into Hafir Al Batin. VII Corps moved the 1st Cavalry Division to prevent an Iraqi attack and to fix Iraqi forces in place to allow the envelopment to take place.

On the right flank, JFC-N, MARCENT, and JFC-E, would hold the enemy's tactical and operational forces in place by breaching Iraqi defenses in Kuwait and encircling Iraqi forces in the heel of Kuwait and Kuwait City. JFC-N would block Iraqi LOC north of Kuwait City. MARCENT would destroy enemy forces and seize key objectives southeast of Al-Jahra City. MARCENT also would protect JFC-N's right flank. Navy and Marine forces in the Gulf would create a deception through amphibious exercises and feints before and during the ground offensive. JFC-E would protect MARCENT's right flank by destroying Iraqi forces and securing key objectives along the coast. Once Kuwait City was encircled and Iraqi forces were ejected or defeated, Arab-Islamic forces from both JFC-E and JFC-N, would liberate Kuwait City. CINCCENT initially designated the 1st Cavalry Division from Fort Hood, TX, as the theater reserve.

To further confuse the Iraqis and perhaps draw off tactical and operational reserves, the ground offensive was to be sequenced. The XVIII Airborne Corps' 6th French Light Armor Division, 82nd Airborne Division, and the 101st Airborne Division (Air Assault) would attack at 0400 on G-Day, in the general direction of Baghdad and the lower Euphrates River to secure the left flank of the main attack. The Marines would attack at the same time, followed by the JFC-E on the coast. The I MEF's specific mission was to attack into Kuwait west of Al-Wafrah to hold and destroy Iraqi forces to their front, hold Iraqi tactical and operational reserves to prevent reinforcement of Iraqi forces in the West, block Iraqi forces' retreat from southeast Kuwait and Kuwait City and help Arab forces enter Kuwait City. The theater main effort, the VII Corps, was not intended to begin until G + 1, followed an hour later by an attack from JFC-N forces.

The main attack was designed to avoid most fixed defenses, drive deep into Iraq, envelop Iraqi forces from the west and attack and destroy Saddam Hussein's strategic reserve – Republican Guard armored and mechanized infantry divisions augmented by several other Iraqi Army heavy divisions. This wide left sweep, sometimes referred to as the "Hail Mary" plan, emphasized the key tenets of AirLand Battle doctrine. Accurate intelligence, air supremacy, the reduction of

Ground Tactical Plan**Figure VIII-14**

combat power by air operations and technological advantages, such as the Small Lightweight Global Positioning System Receivers (SLGRs) sent to the theater during the six-month buildup prior to the offensive, made it possible to cross the desert undetected and effectively apply overwhelming ground combat power from a direction and in a way the Iraqis did not expect.

During the operation, some adjustments were made to the original ground offensive plan. The most significant alteration was the acceleration of the time for the main attack. The high rate of advance by I MEF, JFC-E, and the XVIII Airborne Corps let CINCCENT accelerate the time table for the operation. As a result, VII Corps crossed the line of departure 15 hours ahead of schedule. In addition, after it was apparent the attack by JFC-N was proceeding satisfactorily, the 1st Cavalry Division was released from theater reserve and attached to the VII Corps on Tuesday morning, 26 February. The 1st Cavalry Division moved rapidly around the VII Corps left flank and was in position to conduct the northern assault of the planned corps double envelopment.

Posturing for the Attack

Repositioning of I Marine Expeditionary Force

Because I MEF's area of responsibility had shifted away from the coast, its assault would be conducted through the defenses covering Ahmad Al-Jabir Airfield west of Al-Wafrah. To support this move, supply points at Al-Mish'ab and along the coast had to be moved to newly constructed bases at Al-Kibrit and Al-Khanjar. Two expeditionary airfields and a helicopter complex were built at Al-Khanjar while the existing dirt strip at Al-Kibrit was improved to handle C-130s to support the ground attack. The two divisions leapfrogged past each other, placing the 1st MARDIV on the right and 2nd MARDIV on the left. This simultaneous movement of nearly 60,000 Marines and all their equipment was accomplished using a single dirt road that stretched across 100 miles of desert. Difficult to execute under the best peacetime conditions, the shift was carried out while I MEF elements remained in direct contact with enemy forces.

Once in assembly areas, assault units honed their skills by conducting extensive training and rehearsals. Full scale mock-ups of breach areas were constructed. New engineer equipment arrived, to include armored combat earthmovers and mine-clearing plows loaned by the Army.

The Shift West of ARCENT Forces

Throughout December, the 22nd SUPCOM shifted supplies from the ports to bases near King Khalid Military City. From 17 January to 24 February, while the Coalition air forces waged the air operation, VII Corps, XVIII Airborne Corps, and other coalition elements moved more than 270,000 troops and supplies into position for the attack. XVIII Airborne Corps displaced approximately 260 miles and VII Corps maneuvered west over 150 miles in the same tactical formations that it would use to attack from south to north. This was done without HETs and was a corps level rehearsal for the actual attack. This movement, which continued 24 hours a day for more than three weeks before the start of the ground war, was one of the largest and longest movements of combat forces in history. The total number of personnel and amount of equipment exceeded that moved by General George S. Patton during his attack into the German flank at the Battle of the Bulge. Whole divisions and extensive support structures moved hundreds of miles, undetected by the Iraqis. The move was conducted on largely unimproved roads. The road network not only made repositioning physically difficult, but also complicated movement management. To avoid massive traffic jams, movement schedules were worked out to the last detail. In the dense traffic, vehicles were moving at 15 second intervals.



Figure VIII-15
Convoy During the Shift of Forces

The tactical airlift fleet also supported the westward shift. C-130s established air tactical routings to Rafha, the XVIII Airborne Corps' destination, from airfields near the Corps rear staging areas. These routings were established at low altitudes to ensure the movement would not be detected by the Iraqis and to deconflict them

with the near continuous flow of fighters to targets in Iraq. The C-130s averaged a takeoff and landing out of King Fahd International Airport every seven minutes, 24 hours a day, for the first 13 days of the move.

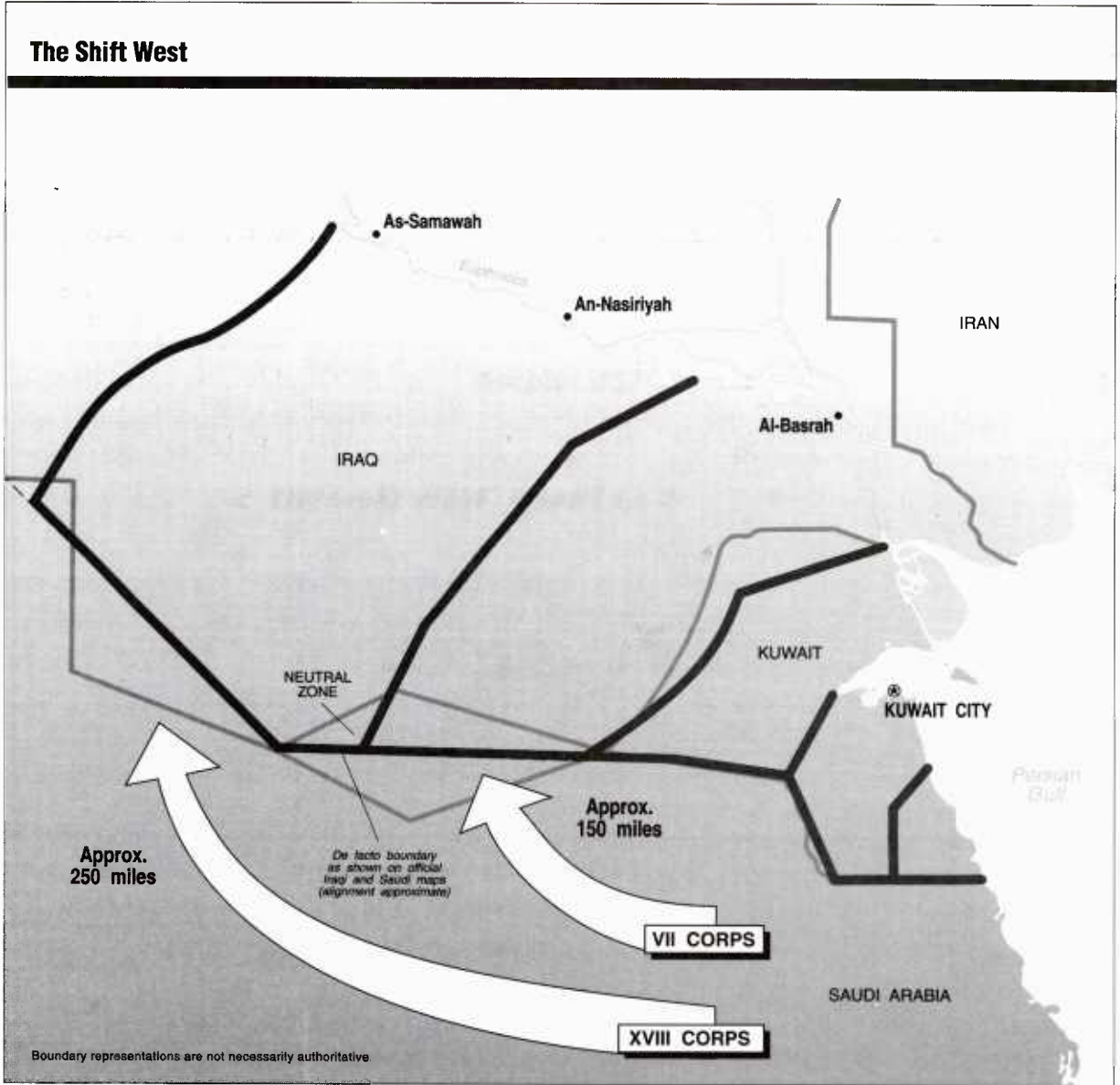


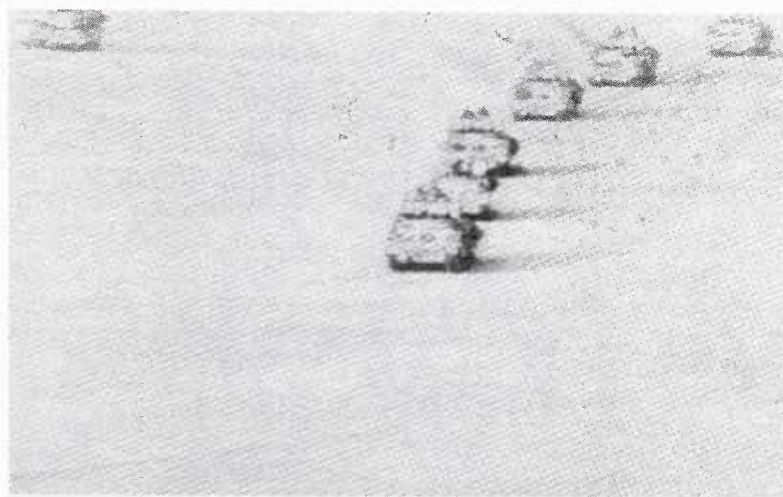
Figure VIII-16

Once forces were at Rafha, the C-130s helped build up the supplies, combat replacements, and the logistics bases. At log base Charlie, the combat engineers blocked a one mile strip of the Trans Arabian Pipeline (Tapline) Road to serve as an airstrip. Only nine miles from the Iraqi border, it was essential to get in and out

quickly. Perhaps the most important cargo delivered was fuel. Aircraft equipped with special bladders brought in more than 5,000 gallons of fuel on each lift and pumped it into waiting fuel trucks.

Preparing and Shaping the Battlefield

Preparation and shaping of the battlefield is intended to seize the initiative from the enemy, forcing him to fight in accordance with your plan rather than his, thus allowing the attacker to exploit the enemy's weaknesses and to maneuver more freely on the battlefield. The concept of preparation and shaping entails two aspects – physical degradation of the enemy's capabilities and psychological operations to deceive and demoralize the enemy. Both are carried out throughout the depth of the battlefield. Physical degradation requires extensive use of supporting arms and raids, both ground and air, to attack and destroy enemy abilities to conduct operations. PSYOPS attack the enemy's will to fight and deceive him, thereby forcing him to react to, rather than anticipate the actions of the attacker. Coalition air and ground forces extensively prepared and shaped the battlefield.



*Figure VIII-17
Combined Arms Forces Move Forward During
Combat Operations*

Deception Operations

CINCCENT placed a high priority on deception operations which were intended to convince Iraq that the main attack would be directly into Kuwait, supported by an amphibious assault. All components contributed to the deception operation. Aggressive ground force patrolling, artillery raids, amphibious feints and ship movements, and air operations all were part of CINCCENT's orchestrated deception operation. Throughout, ground force units engaged in reconnaissance and counter-reconnaissance operations with Iraqi forces to deny the Iraqis information about actual Coalition intentions.

For 30 days before the ground offensive, the 1st Cavalry Division conducted aggressive feints, demonstrations, and artillery raids in the direction of the Iraqi defenses nearest the Wadi Al-Batin. These activities reinforced the deception that the main attack would be launched directly north into Western Kuwait. It also held five infantry divisions and an armored division in place, well away from the actual VII Corps zone of attack.

I MEF also implemented a detailed deception operation. A series of combined arms raids, similar to those conducted in January, drew Iraqi fire, while PSYOP loud speakers broadcast across the border. For 10 days, Task Force (TF) Troy, consisting of infantry, armor, reconnaissance, engineers, Seabees and Army PSYOPS created the impression of a much larger force, engaging enemy elements in the Al-Wafrah area, conducting deceptive communications, and building dummy positions.

These operations complemented the deception effort carried out by amphibious forces off Kuwait's coast. The amphibious task force (ATF), assigned the mission of deceiving the Iraqis into expecting an assault against Kuwait, and conducting that assault should it become necessary, began posturing in the Gulf in mid-January. A well publicized amphibious rehearsal in Oman attracted media attention in the end of January while, simultaneously, Marines from the 13th Marine Expeditionary Unit (Special Operations Capable) conducted a raid on tiny Umm Al-Maradit Island off the Kuwait coast. As the ground offensive approached, the ATF moved into the northern Gulf, conspicuously preparing for a possible assault. Overall, the deception operation was key to achieving both tactical and operational surprise and, ultimately, the ground offensive's success.

Air Preparation of the Battlefield

CINCCENT established priorities for air preparation of the battlefield. Although the ground commanders made recommendations regarding targets and timing of the operation, CINCCENT aligned it with the overall theater plan. Ground tactical commanders found this disconcerting, since they were most concerned about the forces immediately to their front and had only limited information on how CINCCENT was using air power to shape the entire theater. Additionally, by CINCCENT direction, air operations did not initially emphasize destruction of front line Iraqi forces in the KTO until just before the ground offensive. This was done in part to enhance the deception plan. This also concerned the ground commanders, who naturally wanted air power to degrade the Iraqi units immediately in their line of advance.

Coalition air forces flew more than 35,000 sorties against KTO targets, including more than 5,600 against the Republican Guards Forces Command (RGFC). The Service components nominated targets, but CINCCENT apportioned sorties, and the Joint Force Air Component Commander tasked them. Artillery, CPs, C2 facilities, armor, and logistics installations were hit repeatedly. As the ground war approached, the percentage of sorties allocated to the destruction of Iraqi forces in the KTO increased.

In preparation for ground attacks in the eastern portion of the KTO, 3rd MAW used primarily AV-8Bs and F/A-18s to attack targets inside Kuwait. Priority was given to locating and destroying enemy artillery, armor and troops in the central and southern parts of Kuwait. Marine aviation intensified its attacks in Kuwait as the date for the ground offensive approached. By mid-February, 3rd MAW was used almost totally to prepare the battlefield. Aircraft were kept on continuous alert to provide immediate CAS, and to respond to enemy sightings, artillery attacks and Iraqi cross-border incursions.

Ground Preparation of the Battlefield

Iraqi artillery was a primary objective in the battlefield preparation. Iraqi artillery, modern by any standard, often out-ranged Coalition guns, and had been effective in the Iran-Iraq war. While the Coalition could hold Iraqi maneuver forces in position; left unchecked, Iraqi artillery alone might disrupt the Coalition ground assault. Properly used, enemy artillery could have delayed breaching operations long enough for some Iraqi units to counterattack. Additionally, there was a real concern that Iraqi commanders might use artillery-delivered chemical weapons. Accordingly, Iraqi artillery, particularly their most modern systems, were high priority targets during Phase III of the theater campaign. Air, attack helicopters, and Multiple-Launch Rocket Systems (MLRS) were used to destroy enemy artillery. 3rd MAW AV-8Bs and F/A-18s, assisted by Marine unmanned aerial vehicles (UAVs)

and airborne FACs, searched out batteries for destruction. The Army and Marines also conducted many artillery raids to destroy Iraqi artillery.

Reconnaissance and Counter-Reconnaissance

During the air campaign, ground forces conducted extensive reconnaissance to determine the extent and locations of Iraqi obstacles and defensive positions and counter-reconnaissance operations to deceive the enemy regarding Coalition forces disposition. Ground forces conducted raids, patrols, feints and long-range reconnaissance.

Both air and ground maneuver benefited from Army aviation reconnaissance in depth. Attack, scout, and special operations aircraft performed repetitive armed reconnaissance missions in each division zone for days before the ground offensive. Even with the array of deep acquisition platforms, one of the most reliable and timely sources of battlefield information for tactical commanders was human source intelligence (HUMINT) provided by aviation.

Another innovative approach was the extensive use of helicopters to locate Iraqi observation posts and CPs. Flying at night, Army and Marine observation and attack helicopters found and destroyed these positions using Hellfire and other laser-designated munitions such as Copperhead. The same tactics proved effective for air defense sites, and contributed to joint suppression of enemy air defense activities.

During night operations, 30 January, the 24th Infantry Division's Apache attack helicopter battalion, conducting reconnaissance, found an electronic warfare site with their long-range optics. Early in the morning of 31 January, the Battalion Commander ordered Apache A Company across the border to attack it. "It was a great start for the Apaches and a successful raid," the battalion commander said.

The US Army Aviation Center

On the left flank, in the days immediately before the ground offensive XVIII Airborne Corps conducted aerial and mounted raids deep into Iraqi territory to hit armor, artillery, bunkers, and observation posts. The XVIII Airborne Corps reported, that in one armed aerial reconnaissance operation on 20 February, the 101st Airborne Division (Air Assault) aviation brigade destroyed 15 bunkers with air and TOW missile fire and induced 476 Iraqis to surrender. The division, with attack helicopter support, sent CH-47 Chinook helicopters and troops forward to gather the EPWs. By 22 February, 82nd Airborne Division helicopters were penetrating deep into Iraqi territory in daylight.

In the VII Corps area, in preparation for the attack, the 2nd ACR pushed 15 kilometers into Iraq to cover engineers cutting openings in the border berm. Just before the ground offensive, VII Corps reports show that the 1st Infantry Division (Mechanized) engaged 20 Iraqi tanks and killed several enemy soldiers patrolling the border.



Figure VIII-18
AH-64 Apache Helicopters Returning
From a Combat Mission Note:
Aircraft on right has Hellfire missiles,
aircraft on left has expended its
ordnance

SOF operated deep in enemy territory and along the coast, reporting enemy disposition and activities. Early in the crisis, the 5th Special Forces Group (SFG), (Airborne) in cooperation with Saudi paratroopers, had manned observation posts and conducted patrols along the Kuwaiti border to provide early warning of an Iraqi attack. 3rd SFG (A) carried out valuable long-range patrols north of the border. One team used low-light cameras and probing equipment to determine if the terrain north of the border would support armored vehicles. Others, including the British Special Air Service (SAS), watched suspected Iraqi reinforcement routes and searched

for Scud launchers. SEALs conducted reconnaissance operations along the coast to determine enemy dispositions and to clear mines.

In mid-January, I MEF established observation and signal intelligence collection posts along the Kuwait border to try to locate enemy defenses and concentrations. Reconnaissance teams and light armored vehicles kept a watchful eye on the border while screening the forward movement of the 1st and 2nd MARDIVs. The Iraqis reacted quickly; on 17 January, forward elements of 1st Surveillance Reconnaissance and Intelligence Group at Al-Khafji received artillery fire. Marine AV-8Bs on strip alert at King 'Abd Al-'Aziz Expeditionary Airfield in northern Saudi Arabia were launched to silence the Iraqi artillery. On 19 January, several Iraqi soldiers crossed the border and surrendered to Marines, the first prisoners the MEF took.

Beginning 20 January, and continuing for the next 10 days, I MEF conducted combined arms raids along the Kuwaiti border. These raids were designed to deceive the enemy as to the location and disposition of Coalition forces, focus attention toward Kuwait, keep the Iraqis off-balance, and test their response. Marines manning outposts along the border continued to call on AV-8Bs to conduct counterbattery attacks, while UAVs flying from Al-Mish'ab located targets. Although air operations over Iraq absorbed much of the world's attention, the Kuwaiti border had become a scene of active fighting.

As the ground offensive approached, I MEF increased reconnaissance and surveillance, both to deny enemy intelligence collection and to gain a more accurate picture of his dispositions. Reconnaissance teams from both 1st and 2nd MARDIV crossed the border and moved into Kuwait a week before the attack. Elements of two regimental sized task forces from 1st MARDIV began infiltrating on the night of 21 February and during the next two nights, remaining hidden and largely undetected during the day. These elements eliminated Iraqi forward observers, cleared minefield lanes, and positioned themselves to support the mechanized task forces when they attacked on the morning of 24 February.

In the 2nd MARDIV sector, conditions differed markedly. Only a few kilometers separated its attack positions from the Iraqi defenses. The two defensive lines were only two to three kilometers apart and intertwined within the Umm Qudayr oilfields. Obstacles included forward outposts, berms, and fire trenches in addition to the minefields and trenchlines. Before G-Day, the 2nd MARDIV's 2nd Light Armored Infantry (LAI) Battalion crossed into Kuwait on a three-day operation to clear Iraqi outposts and defenses forward of the first obstacle belt.

The Battle of Al-Khafji and Contact at Al-Wafrah

On 29 January, attention abruptly shifted from air operations to the JFC-E and Marine areas. Iraqi armored forces launched cross-border attacks, the most

newsworthy at Al-Khafji. However, a second attack, directed at the area south and west of Al-Wafrah, engaged I MEF's TF Shepherd. A young Marine corporal in the 2nd LAI Battalion scored a TOW antitank missile kill in the dark from more than 3,000 meters as a T-55 tank emerged through the border berm, blocking the exit and halting further Iraqi advance. The next day, the 6th Marine Regiment rushed northward and dug in south of Al-Wafrah, ending any Iraqi threat in that sector, although sporadic artillery fire continued for several days.

At Al-Khafji, Arab forces, supported by Marine forward observers, who called and adjusted artillery and CAS, pushed invading Iraqi columns back into Kuwait. At the height of the fighting, a Marine reconnaissance team, cut off in the town and cornered on the roof of a building, continued to report enemy movements and call in air and artillery fires. These battles proved costly to the Iraqis while instilling new confidence in the Coalition and providing Marines combat experience. (See Chapter 6 for details on air operations at Al-Khafji.)

The Threat as of 23 February – the Day Before the Ground Offensive

Iraqi Defensive Positions and Plan

As discussed earlier, the Iraqi Army was prepared to defend the KTO. Operational and tactical level plans existed, preparations for contingencies were made and executed, and, while some units in the forward areas were composed of second class troops, many Iraqi regular and heavy units put up a fight. The Iraqi defensive strategy, however, was not prepared for the Coalition's offensive strategy. The Iraqi assumption that the tactics used in the Iran-Iraq War would be applicable against the Coalition proved faulty, as did their assumption that the attack would be terrain-oriented in support of the Coalition's political goal of liberating Kuwait. Further, once the air war began, Iraqi tactical intelligence became virtually blind. Most importantly, Iraqi defensive planning was rendered ineffective due to the speed, maneuver, firepower, and technological advantages of the Coalition offensive, which surprised and overwhelmed the Iraqis.

The Iraqis prepared for the expected assault into Kuwait in a manner that reflected the successes of their defensive strategy during the Iranian War. They constructed two major defensive belts in addition to extensive fortifications and obstacles along the coast. The first belt paralleled the border roughly five to 15 kilometers inside Kuwait and was composed of continuous minefields varying in width from 100 to 200 meters, with barbed wire, antitank ditches, berms, and oil filled trenches intended to cover key avenues of approach. Covering the first belt were Iraqi platoon and company-size strongpoints designed to provide early warning and delay any attacker attempting to cut through.

The second obstacle belt, up to 20 kilometers behind the first, began north of Al-Khafji and proceeded northwest of the Al-Wafrah oilfields until it joined with the first near Al-Manaqish. This second obstacle belt actually constituted the main Iraqi defensive line in Kuwait. Obstacles and minefields mirrored those of the first belt.

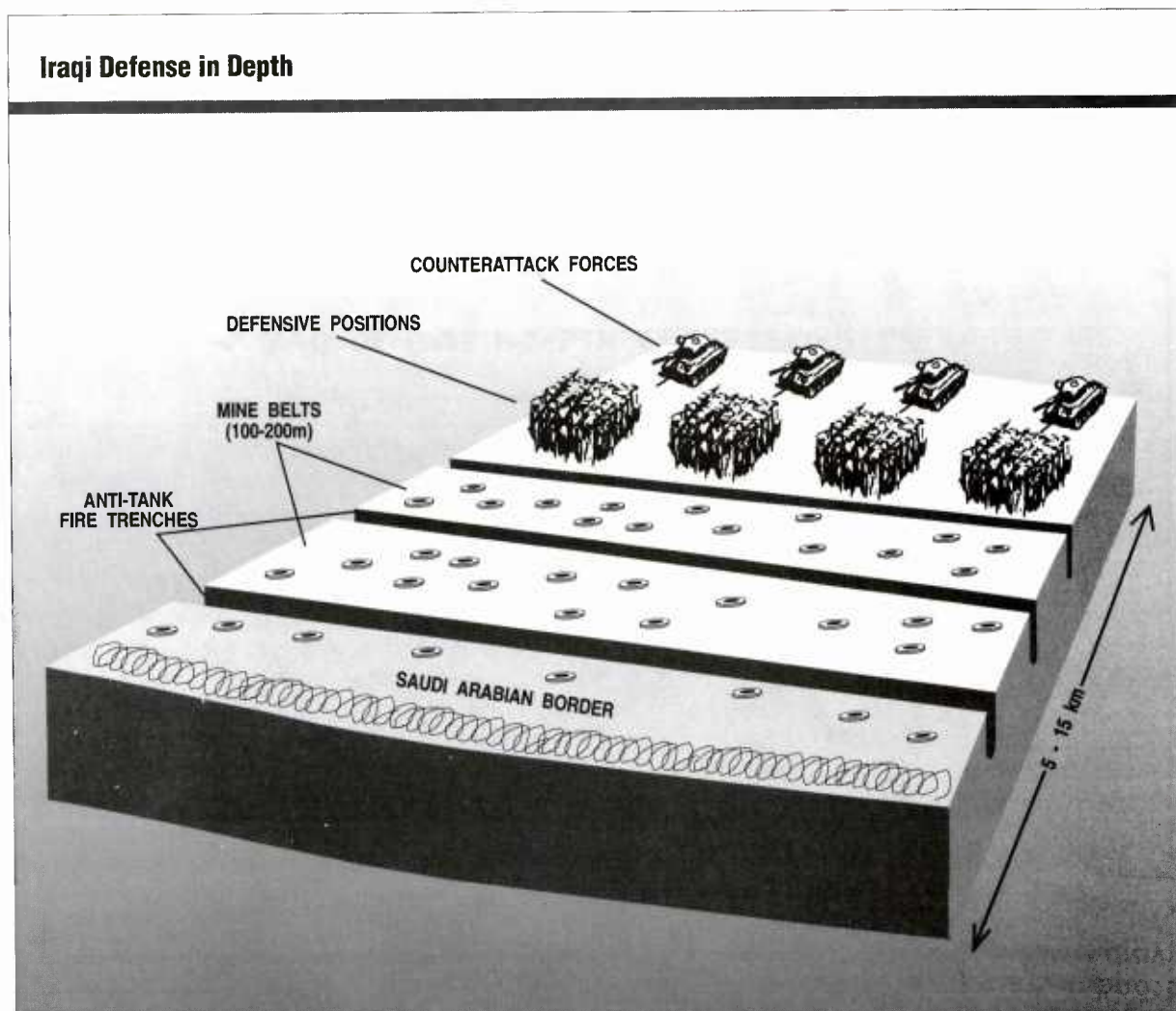


Figure VIII-19

They were covered by an almost unbroken line of mutually supporting brigade-sized defensive positions composed of company trench lines and strongpoints. The minefields contained both antitank and antipersonnel mines.

The Iraqi tactical plan was designed to slow the attacker at the first belt, to trap him in prearranged kill zones between the two belts, and to destroy him before he could break through the second belt. Any attacking forces able to breach the second belt would be counterattacked immediately behind the strongpoints by division and corps level armor reserves.

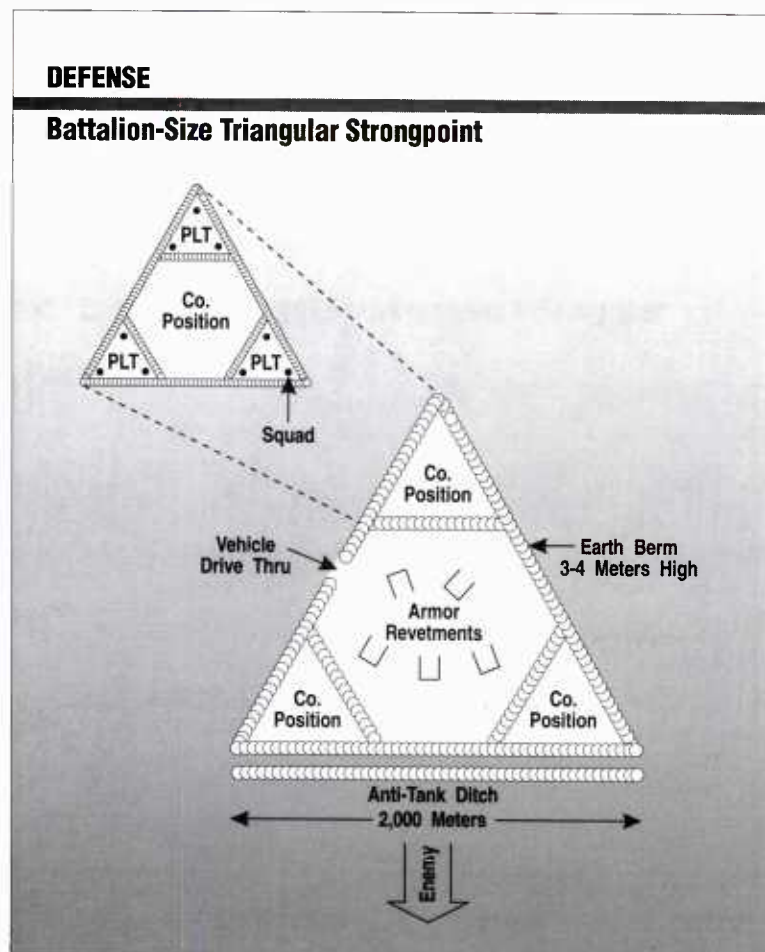


Figure VIII-20

Iraqi Combat Effectiveness

One objective of the initial phases of the theater campaign was to shift the balance of forces more in favor of the Coalition; this goal was achieved. In all, almost 100,000 total combat and support sorties were flown and 288 Tomahawk land-attack missiles launched during the first three phases of the campaign. Of the total sorties flown, 60 percent were combat missions. Damage to Iraqi forces was extensive, and Iraqi C2 was severely degraded. Saddam Hussein's ability to direct his



*Figure VIII-21
Oil Ditch that Iraqis Planned to
Ignite as an Obstacle*

fielded forces was impeded and in many cases, forward corps, division and brigade commanders lost touch with their subordinate commands. Large amounts of equipment were damaged or destroyed. Vast stockpiles of Iraqi supplies, positioned to support the KTO, were destroyed and the road nets on which replenishment had to pass were degraded. Air operations against fielded forces, in conjunction with PSYOPS, helped sap Iraqi morale. Phase III of the campaign greatly reduced Saddam Hussein's ability to bring the strength of his army to bear against the Coalition ground forces.

At the end of more than a month of bombardment, Iraqi forces remained in Kuwait; many, particularly in the front line units, were in poor condition, with their ability to coordinate an effective defense along the border severely reduced. When the ground war started, CINCCENT assessed that, largely through the results of the Coalition air operation, the overall combat effectiveness of the opposing Iraqi forces had been reduced by about half.

It should be noted that while the forward infantry divisions suffered high attrition, a substantial portion of the more capable units, such as the Republican

Guards, and Iraqi armored and infantry divisions to the west and north, still were combat effective. This was, in part, the result of a conscious decision to target the forward defensive positions as a part of the deception plan. As the ground offensive unfolded, many Republican Guards units and other forces to the west and north, even though they were surprised by the advancing Coalition formations, retained much of their combat capability and put up a fight.

Iraqi Disposition and Strength in Theater Before the Ground Offensive

Figure VIII-22 depicts the build-up of Iraqi forces in the KTO as estimated by DIA on 15 January 1991, just before Operation Desert Storm began.

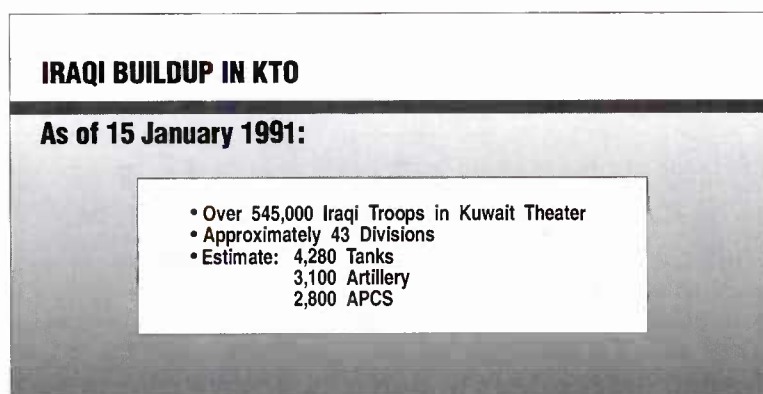


Figure VIII-22
(The true number of Iraqi troops in the KTO remains unknown)

DIA intelligence assessments of enemy attrition and disposition before the ground offensive began indicated the combat effectiveness of all first-line defensive divisions were reduced to less than half. The 45th Mechanized Division south of As-Salman was estimated to be at 50 to 75 percent strength as were the 12th, 52nd, 17th and 10th Armored divisions, the tactical reserves. The two most western Republican Guards divisions, the Tawakalna Mechanized and Al-Madinah Armored divisions, were estimated to be at 50 to 75 percent effectiveness. The general assessment was that the tactical echelon and artillery were severely degraded, the operational echelon's sustainment capability had been eliminated, and the Republican Guard somewhat degraded.

Figure VIII-23 depicts the assessment provided to CINCCENT by his staff just before the ground operation began. Iraqi ground forces in the KTO included elements of up to 43 divisions, 25 of which are assessed as committed, 10 the operational reserve, and eight the strategic reserve. Some independent brigades were operating under corps control. The RGFC and Iraqi Army heavy divisions

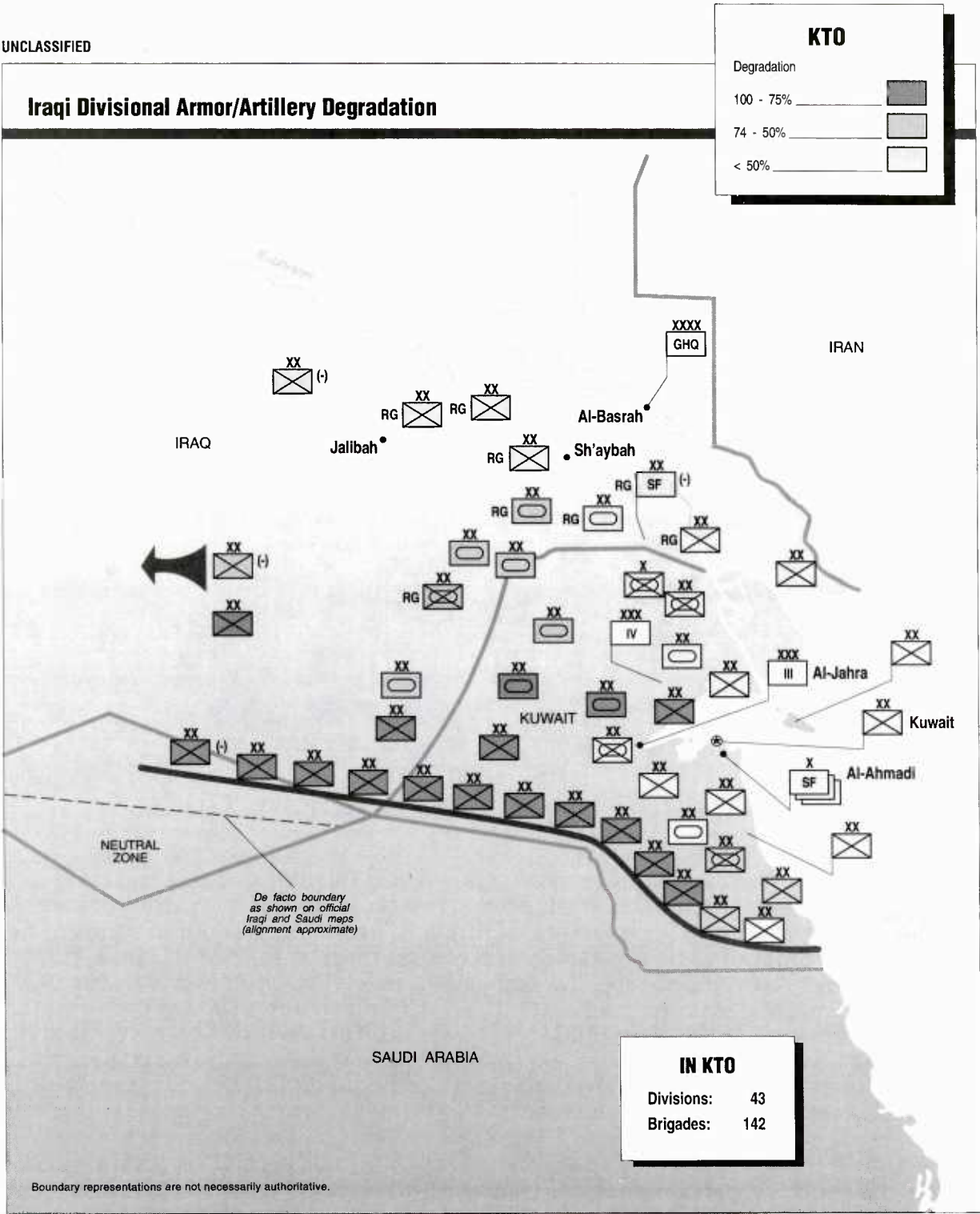


Figure VIII-23

remained deployed in defensive positions behind the tactical and operational forces. On the eve of the ground offensive, the Iraqi forces were arrayed on the ground as portrayed in Figure VIII-24.

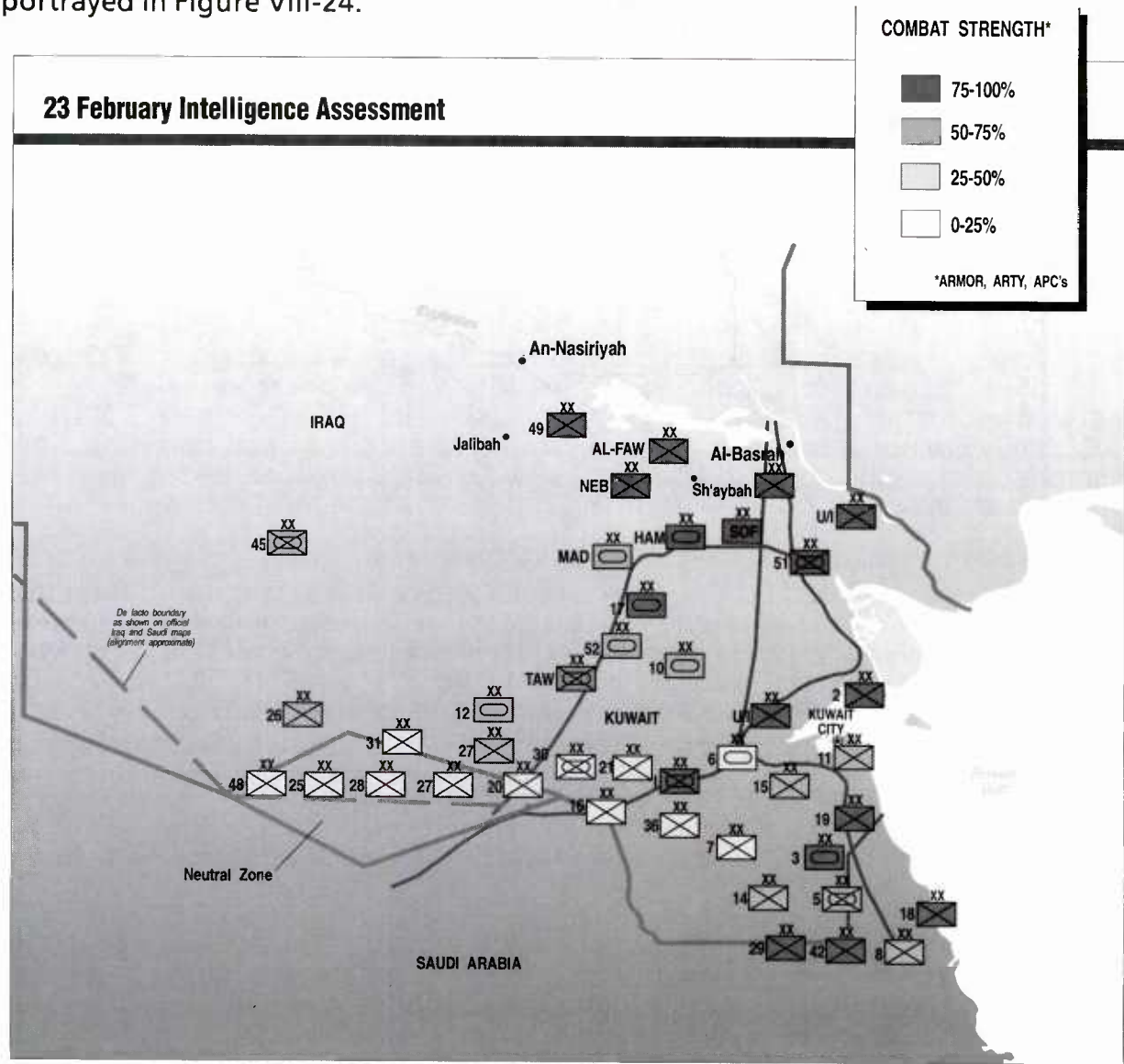


Figure VIII-24

Despite these assessments, the Iraqi military's weaknesses were not so apparent to the ground commanders. They saw an Iraqi force of up to 43 divisions in the theater, arrayed in depth and with strong operational and tactical reserves. Dug-in infantry was reinforced by revetted tanks and artillery, all backed by armored reserves of brigade strength or larger. In central Kuwait, roughly in the area between 'Ali As-Salim airfield and the Kuwait International Airport, one armored

and two mechanized divisions formed strong corps-level reserves, with additional armored forces to the northwest of Al-Jahra. Along the beaches, in testimony to the Iraqi fear of an amphibious assault, no fewer than four infantry divisions and a mechanized division occupied positions behind minefields and obstacles. Finally, along the Iraq-Kuwait border, at least six Republican Guards divisions and other armored, mechanized, and infantry divisions were poised to counterattack. On the eve of the ground offensive, Coalition planners thought nearly 450,000 Iraqi troops remained in the KTO.

Weather

Weather was a factor during the entire campaign. Approximately 15 percent of all scheduled attack sorties during the first 10 days of air operations were canceled because of poor visibility or low overcast in the KTO. Ceilings of 5,000 to 7,000 feet were not uncommon, especially during the ground operation. Coalition planners assumed the standard 13 percent cloud cover, typical for the region at that time of year. In fact, cloud cover persisted 39 percent of the time, the worst in 14 years.

The early morning of G-Day was marked by adverse weather throughout the area. Blowing sand and rain, along with dense smoke from burning oil wells, made visibility extremely poor. These conditions early in the ground operation improved the US technical advantage in electro-optics. At the same time, it inhibited CAS and proved the value of the Joint Surveillance Target Attack Radar System (JSTARS) as both an operational indicator of enemy movement and a deep targeting system. The bad weather at the beginning of the attack also threatened sustainability by making cross-country mobility difficult for wheeled logistics vehicles. Fortunately, the skies cleared and the cease-fire was declared before serious sustainment problems developed. (Weather also was a factor in fire from friendly forces, as noted in Appendix M.)

Disposition of Coalition Forces on the Eve of the Ground Offensive

When the ground offensive began, Coalition forces were poised along a line from the Persian Gulf 300 miles west into the desert, in four major formations. Figure VIII-25 depicts how these formations were arrayed.

Army Component, Central Command

ARCENT, which consisted of the XVIII Airborne Corps and VII Corps, was on the western flank of the theater. Positioned on ARCENT's left flank was the XVIII Airborne Corps; VII Corps was to the right. These two corps covered about two thirds of the line occupied by the multi-national force.

Joint Forces Command - North

JFC-N, in the center, consisted of the 3rd Egyptian Mechanized Division, the 4th Egyptian Armored Division, the 9th Syrian Division, the Egyptian Ranger Regiment, the Syrian Special Forces Regiment, the 20th Mechanized Brigade, Royal Saudi Land Forces (RSLF), the Kuwaiti Ash-Shahid and Al-Tahrir Brigades, and the 4th Armored Brigade (RSLF).

I Marine Expeditionary Force

I MEF, on the right of JFC-N, had the 2nd MARDIV, with the attached Tiger Brigade on the left and the 1st MARDIV on the right. The 5th MEB, coming ashore at Al-Jubayl and Al-Mish'ab and staging near Al-Khanjar, acted as the MEF reserve. 3rd MAW flew from bases in Saudi Arabia and Bahrain, basing AV-8Bs and attack helicopters forward at Tanajib and Al-Khanjar, respectively.

Joint Forces Command - East

On the right flank, along the coast, JFC-E anchored the Coalition line. Like JFC-N, JFC-E was under the command of Saudi Lieutenant General Khalid bin Sultan. JFC-E consisted of units from all six Gulf Cooperation Council (GCC) member states. There were three task forces – TF Omar, consisting of the 10th Infantry Brigade (RSLF) and an United Arab Emirates (UAE) Motorized Infantry Battalion; TF Othman, consisting of the 8th Mechanized Infantry Brigade (RSLF) an Omani Motorized Infantry Battalion, Bahrain Infantry Company, and the Kuwaiti Al-Fatah Brigade; TF Abu Bakr with the 2nd Saudi Arabian National Guard (SANG) Motorized Infantry Brigade and a Qatar Mechanized Battalion.

G - 1 Dispositions 23 February

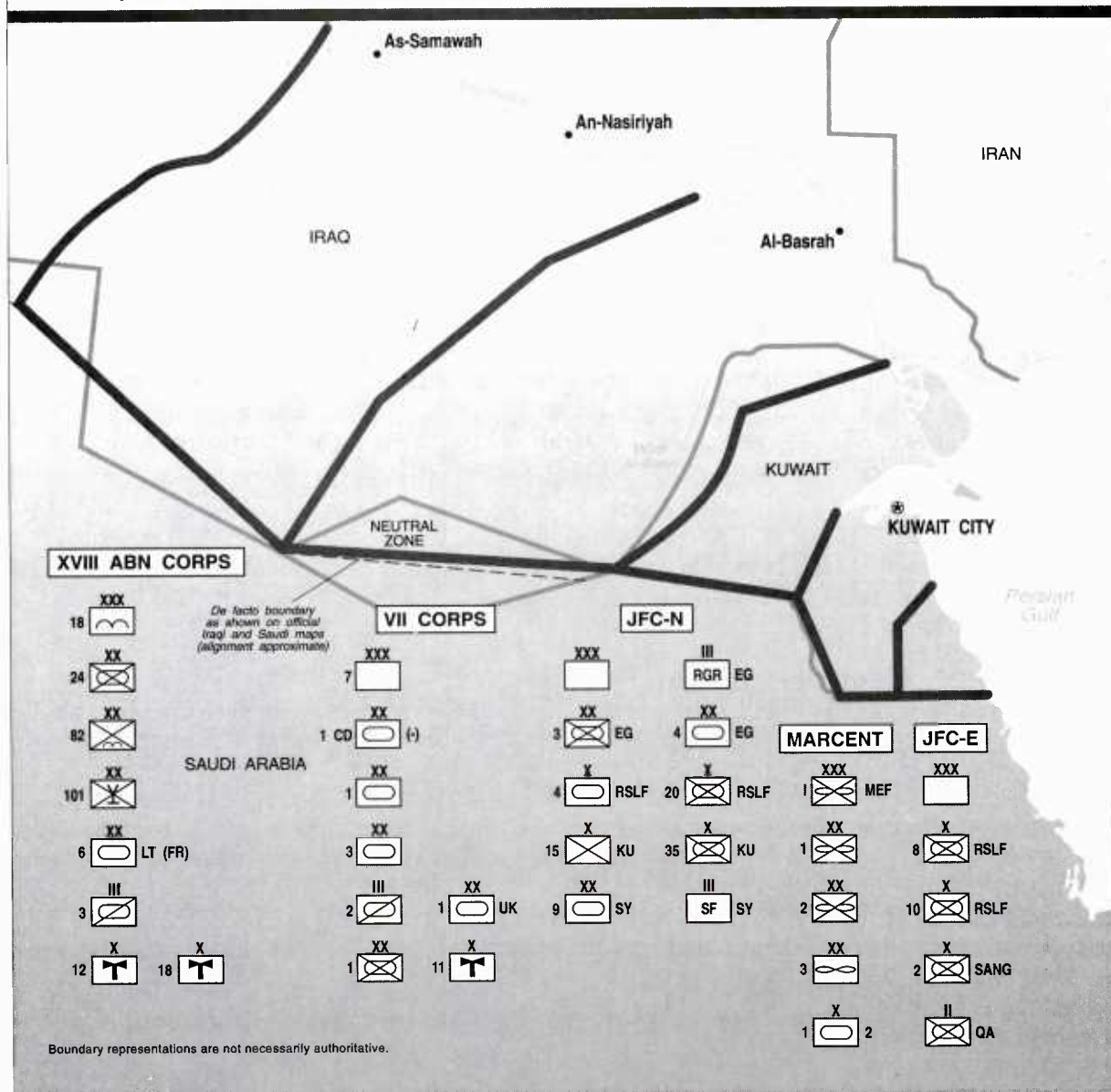


Figure VIII-25

CONDUCT OF THE GROUND OFFENSIVE

At 0400 24 February, the ground assault to liberate Kuwait began. CENTCOM unleashed combined arms attacks against Iraqi forces at three points. In the far west, the French 6th Light Armored Division, (with the 2nd Brigade, 82nd

Airborne Division under its operational control) , and 101st Airborne Division (Air Assault) conducted a massive air and ground envelopment to secure the Coalition western flank and establish forward support bases deep in Iraq. In the center of the Coalition line, along the Wadi Al-Batin, the dry ravine that separates Kuwait from Iraq, the 1st Cavalry Division, the theater reserve, feinted an attack north toward a heavy Iraqi concentration. In the east, I MEF and JFC-E, attacked north into Kuwait.

G-Day (24 February) – The Attack and the Breach

Enemy Actions and Dispositions

When the ground offensive started, Iraqi ground forces remained in defensive positions in the KTO. There were no indications of any Iraqi troop withdrawal. Iraqi front line units, including the 7th, 14th and 29th Infantry divisions in the I MEF zone and the 19th Infantry Division in the JFC-E zone, offered sporadic, but sometimes stiff, resistance. These forces were bypassed, withdrew or surrendered. Despite these initial setbacks, the Iraqi III Corps, opposite I MEF and JFC-E and the Iraqi IV Corps, generally opposite JFC-N, still could counterattack with units from the 3rd Armored Division south of Kuwait International Airport. However, the large number of III Corps soldiers surrendering suggested many had lost the will to fight. For the Iraqis to stop the Coalition ground offensive, mobile forces would have to leave their revetted positions, making them vulnerable to Coalition air attack.

Iraqi artillery fired at Coalition forces during the ground offensive was persistent but inaccurate. The Iraqis appeared to fire on known points, but did not shift or follow targets. The infantry fought initially, but surrendered when Coalition forces approached their positions. Coalition forces found ammunition stored throughout the trenches. The front line infantry forces' performance demonstrated serious shortcomings, particularly in coordinated indirect fire, air defense, and morale. Perhaps Iraqi commanders anticipated difficulties since intelligence sources indicated some RGFC artillery units were assigned to regular army divisions in southeastern Kuwait.

Enemy prisoners of war (EPWs) and deserters who crossed the Saudi border before the ground offensive began, complained of the lack of food and water and poor sanitation. A former battalion commander reported morale was poor, and he had not communicated with his brigade since the end of January. Expressing surprise that Americans were in front of his forces, he lacked specific Coalition force dispositions: this illustrates Iraq's weak battlefield intelligence capabilities, the breakdown of communications with higher headquarters, and the success of the Coalition in achieving surprise.

G - Day 24 February

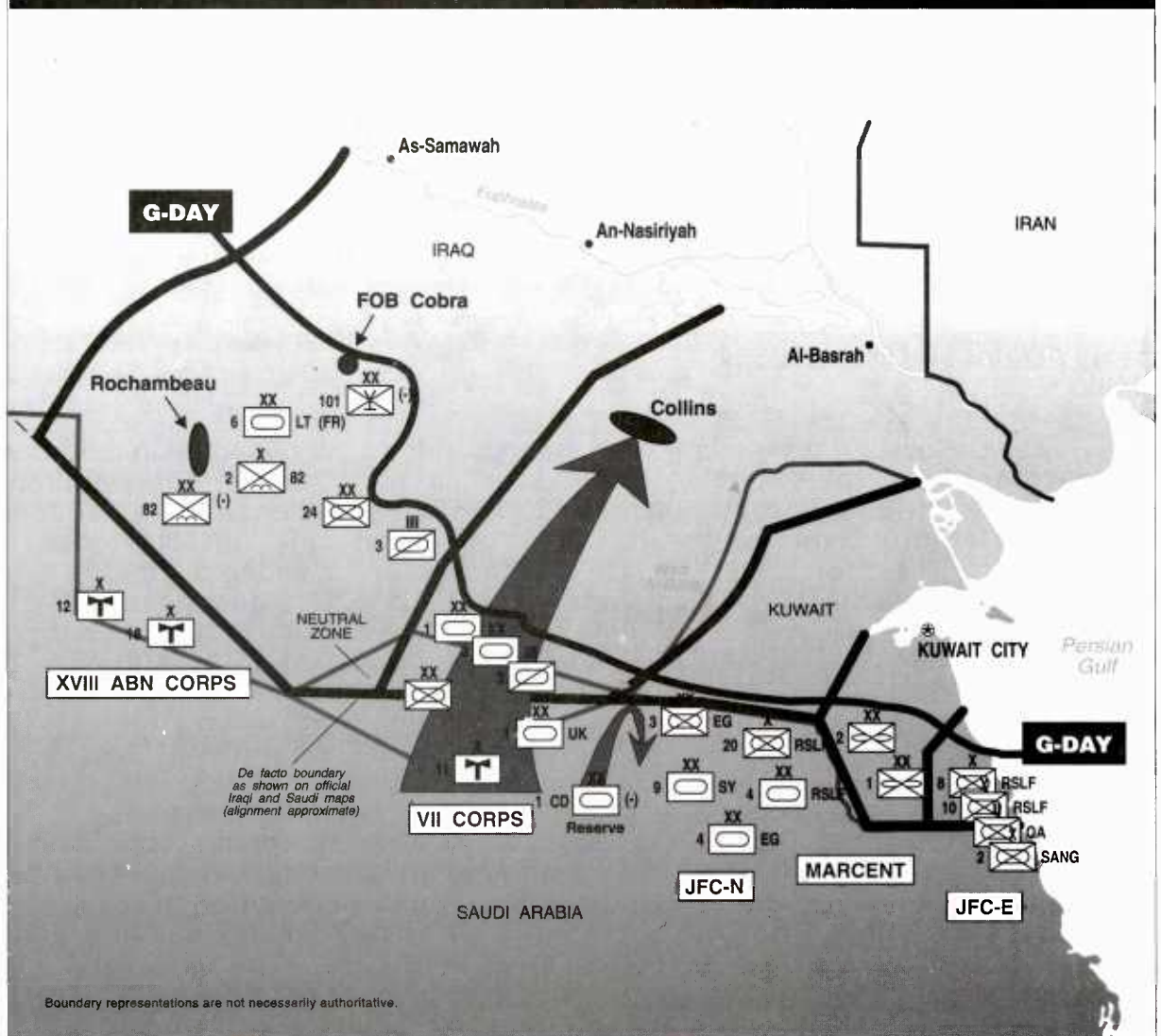


Figure VIII-26

Army Component, Central Command

XVIII Airborne Corps

XVIII Airborne Corps was tasked to penetrate approximately 260 kilometers to the Euphrates River, cut the Iraqi LOC along Highway 8 to Baghdad, isolate Iraqi

forces in the KTO, and help destroy the theater reserve – the RGFC. The 6th French Light Armored Division with a brigade from the 82nd Airborne Division under operational control (OPCON) and the 82nd Airborne Division (with two brigades) were along the western Corps boundary and began the theater ground attack. The 101st Airborne Division (Air Assault) was east of the French. Its mission was to penetrate rapidly by air assault to the Euphrates River, cut the LOC between Baghdad and Iraqi forces in the KTO, destroy all enemy forces along those routes, and turn east to block north of Al-Basrah. In the center of the Corps zone, the 24th Infantry Division (Mechanized) was to attack through Iraqi forces in their zone to the Euphrates River, then turn east to destroy RGFC forces trapped in the KTO. On the Corps eastern boundary, the 3rd ACR was to secure the Corps right flank and maintain contact and coordination with VII Corps.

At 0400, 6th French Light Armored Division scouts advanced into Iraq. Three hours later, the French main body attacked through a light rain. Its objective was As-Salman, a small airfield about 90 miles inside Iraq. Reinforced by the 2nd Brigade, 82nd Airborne Division, the French crossed the border unopposed and attacked north. Short of their objective, the French ran into outposts of the 45th Iraqi Mechanized Infantry Division. After a brief battle, using missile-armed Gazelle attack helicopters against dug-in enemy tanks and bunkers, the French captured 2,500 prisoners and controlled the objective. The French moved on through Objective Rochambeau and onto As-Salman, known as Objective White in the plan, without opposition. Less than seven hours into the operation, the French 6th Light Armored Division, supported by the 82nd Airborne Division, secured its objectives and continued the attack north. The left flank was secured.

The remaining two brigades of the 82nd Airborne Division, following the French advance, were tasked to clear and secure a two-lane highway into southern Iraq. This road, Main Supply Route (MSR) Texas, would be used to move troops, equipment and supplies supporting the corps' advance north. The 101st Airborne Division (Air Assault) was scheduled to attack at 0500, but fog over the initial objective forced a delay. While the weather posed problems for aviation, indirect fire support missions continued. Corps artillery and rocket launchers fired on objectives and approach routes. Two hours later, the 101st Airborne Division (Air Assault) began its attack with its AH-64s, AH-1s, 60 UH-60s and 40 CH-47s augmented by the XVIII Airborne Corps' 18th Aviation Brigade and began lifting the 1st Brigade into what became Forward Operating Base (FOB) Cobra, 93 miles into Iraq and halfway to the Euphrates River. Over three hundred helicopter sorties ferried the troops and equipment into the objective area in the largest heliborne operation in military history.

The Iraqis were scattered and disorganized. By mid-afternoon, the number of EPWs increased. Chinook helicopters lifted artillery, ammunition, refueling equipment, and building materials into FOB Cobra to create a major logistics base and refueling point. By the end of G + 2 the 101st Airborne Division (Air Assault) had 380,000 gallons of fuel at FOB Cobra. This logistics base allowed the XVIII Airborne Corps to move infantry and attack helicopters north quickly to block Highway 8 and served as a springboard to move eight attack helicopter battalions and cavalry

At approximately 0700 hours, 60 UH-60 Blackhawks and 30 CH47D Chinooks carrying 1st Brigade's first air assault element climbed from the brigade's pickup zone in TAA Campbell. In just over an hour, the aircraft had safely deposited some 500 soldiers 93 miles deep into Iraq. The 1st Battalion, 82nd Brigade of Iraq's 49th Infantry Division had entrenched themselves just north of MSR Virginia. The 1/327th Infantry discovered the Iraqi battalion while clearing FOB Cobra in zone. A sharp firefight ensued. The Iraqi battalion commander surrendered once the 1/327th attacked his position. Upon his capture, the Iraqi commander was persuaded to use a bullhorn to convince his 300-plus soldiers to lay down their arms.

Situation Report from the 101st Airborne Division (Air Assault)



*Figure VIII-28
UH-60 Blackhawks and AH-64 Apaches Lift Off for
Air Assault*

Iraq and cut Highway 8. The first of several roads connecting Iraqi forces in Kuwait with Baghdad was closed.

Because the initial attacks by the 6th French Light Armored Division and the 101st Airborne Division (Air Assault) were so successful, the 24th Infantry Division (Mechanized) crossed the line of departure about five hours ahead of schedule. The

division attacked with three brigades abreast. The division cavalry squadron conducted reconnaissance and protection operations to the front. The 24th Infantry Division (Mechanized) advanced rapidly, maintaining a speed of 25 to 30 miles an hour, and pushed about 50 miles into Iraq against light opposition. Their attack continued into the night. The division kept on its course with the aid of long range electronic navigation, image enhancement scopes and goggles, infrared (IR) and thermal imaging systems (TIS), and GPS. By midnight, the Division was 75 miles into Iraqi, poised to continue the attack.



*Figure VIII-29
M2 Bradley Fighting Vehicles during Offensive*

"In their movement across the line of departure, and whenever not engaging enemy forces, battalions of the 24th Infantry Division moved in 'battle box' formation. With a cavalry troop screening five to ten miles to the front, four companies, or multi-platoon task forces, dispersed to form corner positions. Heavier units of the battalion, whether tanks or Bradleys occupied one or both of the front corners. One company, or smaller units, advanced outside the box to provide flank security. The battalion commander placed inside the box the vehicles carrying ammunition, fuel, and water needed to continue the advance in jumps of about 40 miles. The box covered a front of about four to five miles and extended about 15 to 20 miles front to rear."

US Army Center for Military History

VII Corps

VII Corps conducted the theater main attack with the mission of destroying the armor-heavy RGFC. The VII Corps plan of advance paralleled that of the XVIII Airborne Corps – a thrust north into Iraq, and a massive right turn toward the east. Once the turn was completed, both corps were to coordinate their attacks to trap the Republican Guards divisions. They were then to press until the RGFC was eliminated. The original plan was for VII Corps to attack on 25 February, but initial success attained by I MEF, JFC-E, and the XVIII Airborne Corps enabled the theater commander to accelerate the schedule by 15 hours.

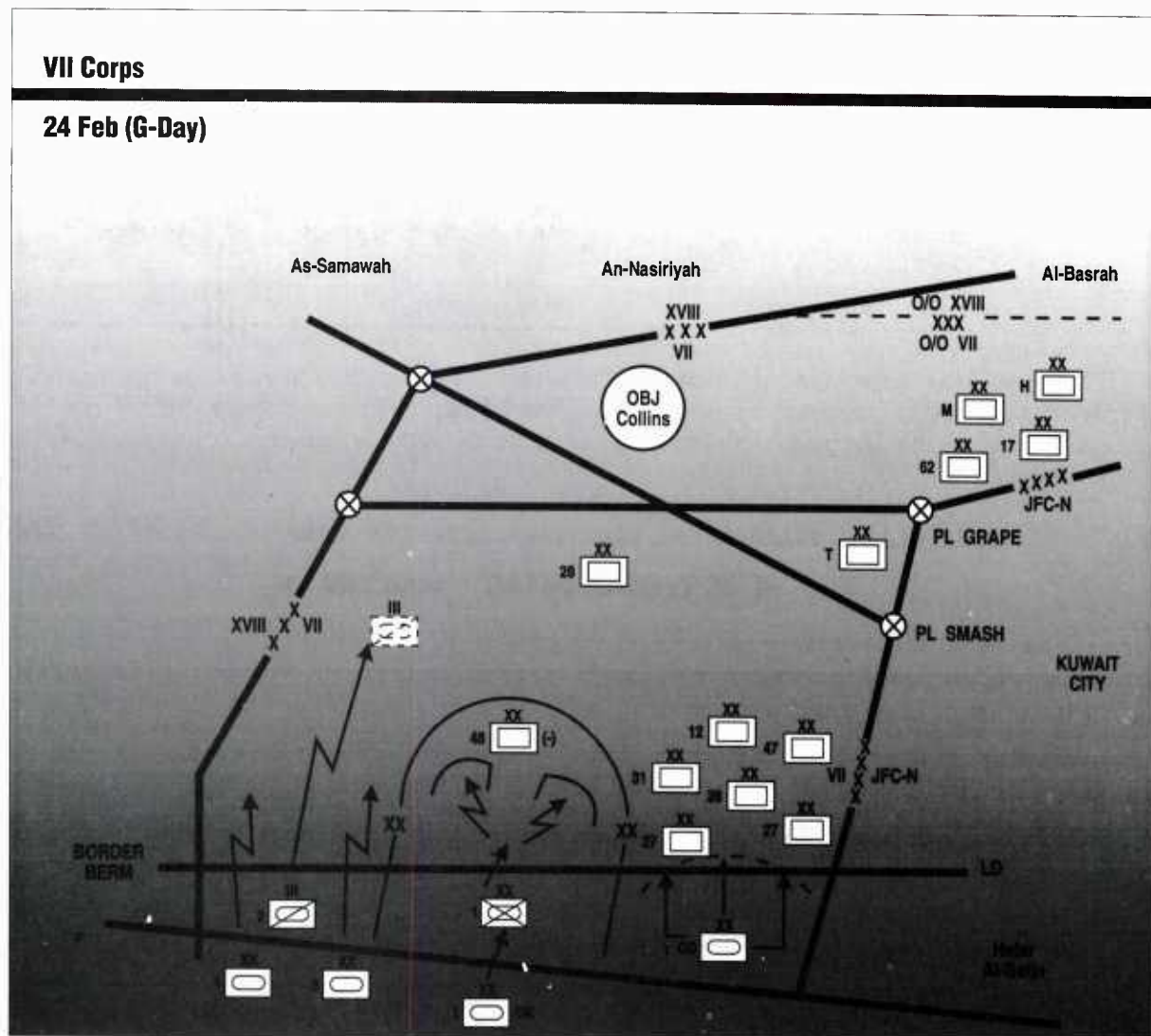


Figure VIII-30

The VII Corps' plan was a feint and envelopment, much like the overall theater strategy. The 1st Cavalry Division, still the theater reserve at this point, would make a strong, but limited attack and feint along the Wadi Al-Batin, causing the Iraqi forces to believe the main attack would come from that direction. While Iraq's attention was focused on the 1st Cavalry Division, the VII Corps commander would send two divisions through the berms and mines along the corps' east flank and the ACR, followed by two more divisions, around the Iraqi defenses on the corps' west flank. 1st UK Armoured Division was assigned the mission to pass through the breach created by the 1st Infantry Division and to attack the Iraqi armored division in its zone to prevent it from moving into the flank of advancing VII Corps. VII Corps planned to move considerable fuel and ammunition through the breach to a logistics site in the 1st Infantry Division (Mechanized) zone. Clearing the breach of enemy infantry and artillery was a priority so as not to interrupt either the passage of 1st UK Armoured Division or the Corps CSS assets.

Before the start of the VII Corps main attack, 2nd ACR swept to the west of the Iraqi obstacles and crossed into Iraq. AH-64 attack helicopters and artillery raids intensified across the VII Corps front. With the 2nd ACR leading on the corps west flank, 1st and 3rd Armored divisions crossed the line of departure and attacked north.

"A 2nd ACR 'Iron' Troop soldier recounted: 'That's one time I was really scared, when we crossed the berm. That was a really intense moment.' His was the first tank through, but fear of the unknown turned out to be fear of nothing."

Soldier Magazine, June 1991

The 1st Infantry Division (Mechanized) began to cut lanes through a complex obstacle belt of wire and land mines against little resistance. By the time the 1st Infantry Division had crossed the line of departure, the lead elements of the 2nd ACR, leading the 1st and 3rd Armored divisions along the Corps' west flank, already had pushed more than 30 km into Iraq. The 1st Infantry Division was given a warning order to leave a battalion task force in the breach and, after passage of the 1st UK Armoured Division, to move forward to make the third division of the three division force against the RGFC. 1st Cavalry Division was still under CENTCOM control.

Breaching the mine fields posed more problems than enemy fire. By nightfall, the 1st Infantry Division had successfully breached about 50 percent of the enemy's obstacle belt and forward defenses, and captured several hundred EPW. During the night of 24 February, the 1st Infantry Division consolidated, repositioned artillery, and coordinated for the 1st UK Armoured Division's passage of lines through the 1st

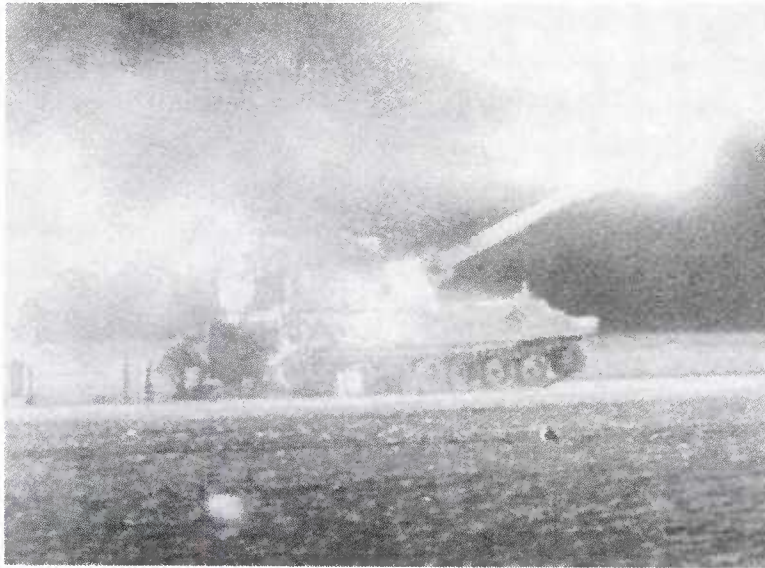


Figure VIII-31
M-109 Self-propelled Howitzer Provides Fire In
Support of Attack

Infantry Division positions. Since the 1st UK Armored Division would not be able to clear the breach that evening, VII Corps halted the advance of the 1st and 3rd Armored divisions for the night. Across the VII Corps front, in-depth artillery fire against the enemy continued throughout the night.

On line from west to east, 1st Armored and 3rd Armored divisions followed the axis cleared by the 2nd ACR. In the center, 1st Infantry Division continued its deliberate breach of the Iraqi defenses by plowing through the berms. On the Corps eastern flank, the 1st UK Armoured Division prepared to pass through the 1st Infantry Division to attack the Iraqi tactical reserves.

Joint Forces Command - North

At 1600 hours 24 February, the 3rd Egyptian Mechanized Division, TF Khalid and TF Muthannah began to attack Iraqi positions in Kuwait. They encountered Iraqi fire trenches, minefields, barriers, and harassing fires as they crossed the border in their zone. Saudi and Kuwaiti forces began the offensive shortly after the Egyptians. The Egyptians, concerned about an Iraqi armored counterattack, halted their advance short of their initial objectives and established blocking positions in sector for the night. They resumed offensive operations at daybreak the following day. Meanwhile, the 4th Egyptian Armored Division prepared to follow the 3rd



*Figure VIII-32
Engineer Equipment Typical of that Used in 1st
Infantry Division Breaching Operations*

Egyptian Mechanized Division. The 9th Syrian Armored Division followed the Egyptian Divisions as the JFC-N reserve and conducted screening operations with one reconnaissance battalion on the right flank to tie in with MARCENT.

I Marine Expeditionary Force

I MEF began the assault at 0400, aimed directly at its ultimate objective, Al-Mutl'a Pass and the roads leading from Kuwait City, 35 to 50 miles to the northeast. I MEF faced the strongest concentration of enemy defenses in theater. The 1st MARDIV led the attack from a position just west of the "elbow" of the southern Kuwait border. The 2nd MARDIV attacked 90 minutes later. Against sometimes stiff resistance, the I MEF succeeded in breaching two defended defensive belts, opened 14 lanes in the east and six lanes in the west, and established a solid foothold inside Kuwait. These breaching operations were successful because of detailed preparation, including reconnaissance and mapping of obstacles, followed by extensive training and rehearsals.

Most importantly, the I MEF diverted the attention of the Iraqi high command, which remained focused on Kuwait, largely oblivious to the enveloping threat to the west. At the end of the day, I MEF had captured more than 8,000 EPW and attacked 20 miles into Kuwait.

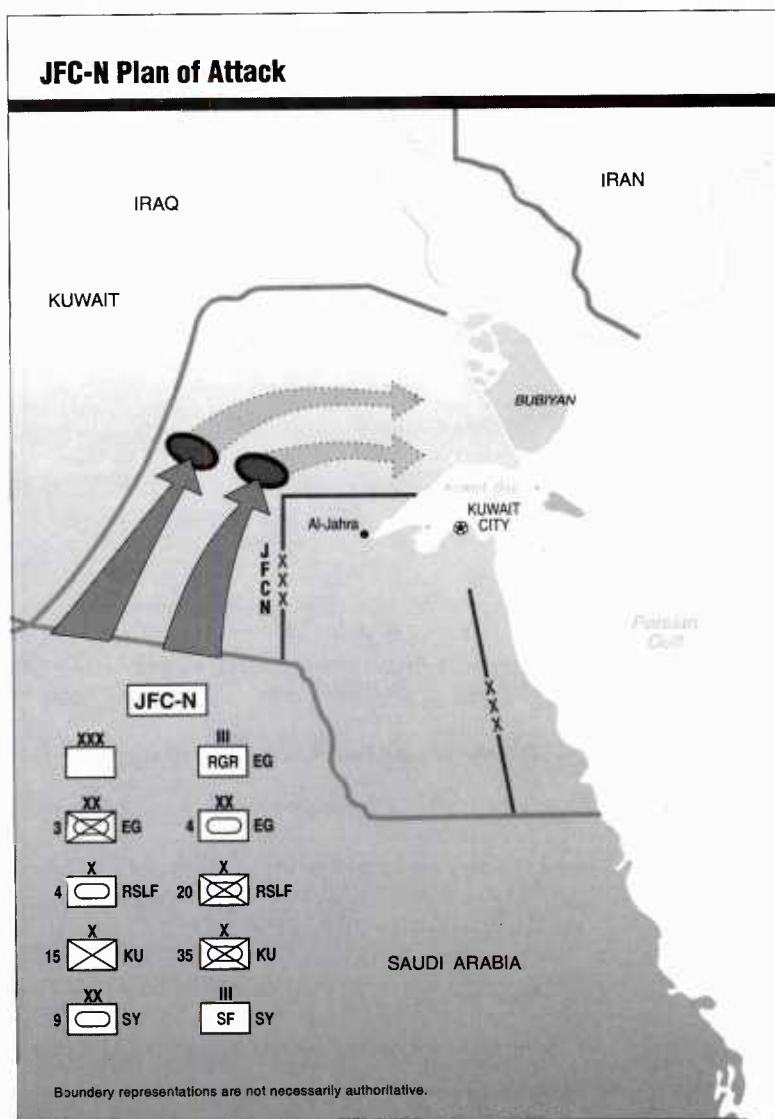


Figure VIII-33

On the right, 1st MARDIV, led by TF Ripper and covered by the two TFs that had infiltrated earlier, completed its breach of the two defensive belts. The division's after action report indicated they destroyed the older Iraqi T-55 and T-62 tanks with M60A1 tanks, TOW-equipped High Mobility Multi-Wheeled Vehicles (HMMWVs), and heavy artillery. The 3rd MAW provided both CAS and interdiction. There were several individual acts of heroism during this intense fighting.

Advancing north, the division bypassed Ahmad Al-Jabir airfield, opting to clear its buildings and bunkers later with infantry. Light Armored Infantry (LAI)



*Figure VIII-34
1st Marine Division Advances as Oil Wells Burn in
the Background*

screened the right flank of the division while Marines continued to clear the enemy in zone.

To the west, 2nd MARDIV, with the reinforced 6th Marines in the lead, blasted its way through the obstacle belts against moderate resistance. The leading regiment advanced in three battalion columns through mortar and artillery fire. The initial opposition came from Iraqi defenders dug in behind the first minefields. The Iraqis were silenced quickly by Marine infantrymen and tanks supporting the combat engineers. Here too, there were examples of heroism. A young Marine reserve combat engineer twice raced into the minefields to reprime a failed line charge while under small arms and artillery fire.

After clearing the first obstacle, the 6th Marines turned left and attacked the more heavily defended obstacles. Marine engineers used M-154 Mine Clearing line charges and M60A1 tanks with forked mine plows and rakes to clear six lanes in the division sector. Temporarily delayed on the right, the regiment pushed its battalions through the center and left breach lanes, turned and eliminated resistance on the right. Once through, the regiment advanced to its objectives, overrunning elements of the Iraqi 7th and 14th Infantry divisions. The 2nd MARDIV noted in its after action report that the regiment captured more than 4,000 EPW including the Iraqi 9th Tank Battalion with 35 operational tanks.

Having secured its objectives by 1400, the 6th Marines spread out and prepared for an Iraqi counterattack, while the remainder of the 2nd MARDIV passed

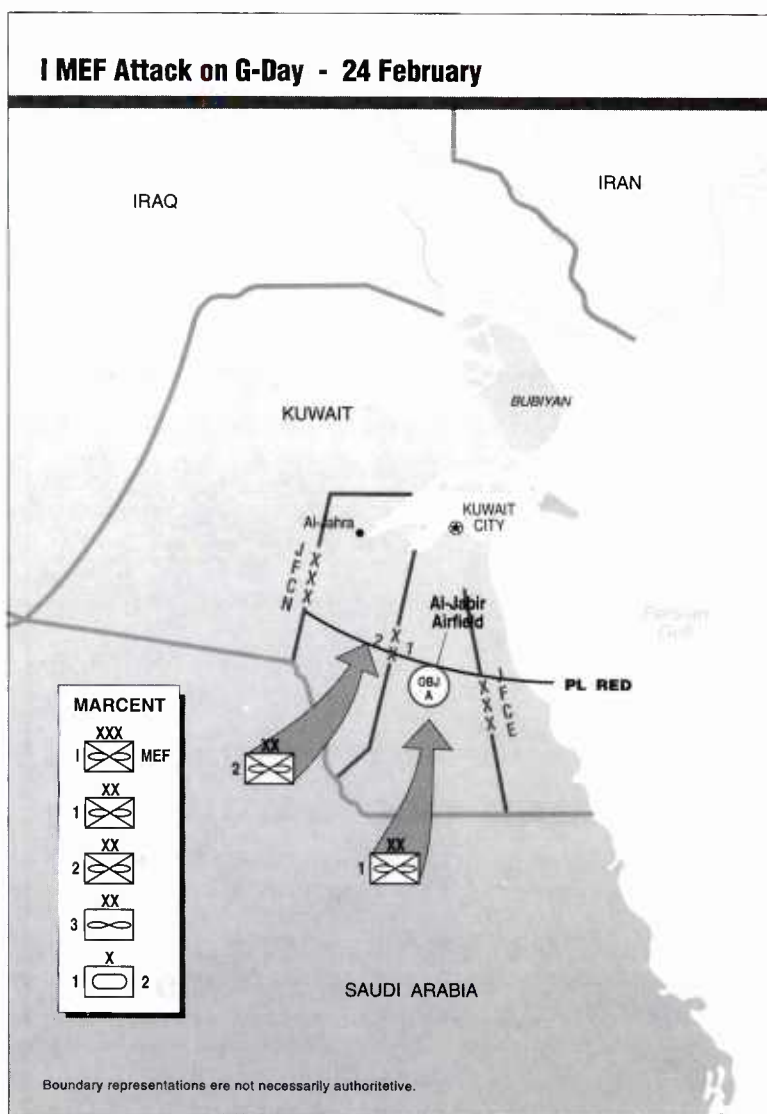


Figure VIII-35

through the breach lanes and assumed positions to its right and left. By nightfall, the bulk of the 2nd MARDIV had passed through the breach.

Iraqi troops had displayed dogged fighting qualities when attacked frontally, only to quickly surrender when flanked or attacked from the rear. By day's end, I MEF had overrun the Iraqi defensive line and eliminated the better part of three infantry divisions. As the Marines consolidated, CH-46s and CH-53s shuttled into landing zones, replenishing ammunition and picking up EPWs.

On the night of 23 February, Marines from Task Force Grizzly sought a path through the Iraqi minefields to secure a passage for the mechanized attack of the 1st Marine Division on G-Day. Unable to locate a path and with time running out, a staff sergeant moved forward with his bayonet, quietly probing for mines by hand and marking his path with luminescent chemical lights. Working feverishly, he opened a lane sufficient for two rifle companies to pass through and secure the far side.

War Records



*Figure VIII-36
Iraqi Tank Takes a Fatal Hit*

The initial Marine air focus was on support to the ground forces and second to targets deeper inside Iraq. The 3rd MAW provided support to JFC-E as well as to MARCENT during this period. To provide 24-hour support to ground forces, the 3rd MAW developed the concept of push flow, which entailed a section of attack aircraft checking in with the ground units through the Direct Air Support Center every seven minutes. Prebriefed on the scheme of maneuver, the pilots would then be "pushed" to a requesting unit or, if not needed, "pushed" to an airborne FAC for direction to targets behind enemy lines. Airborne or ground FACs exercised positive control throughout the mission.

A key factor in the day's success was 3rd MAW CAS. AV-8Bs and F/A-18s orbited overhead, waiting for requests to support ground elements. AH-1s waited

As the lead elements of the 6th Marine Regiment fought their way through the enemy obstacle belts on the morning of G-Day, the strains of the Marine Corps Hymn could be heard above the sound of artillery, mortar, and small arms fire. Marines, many under fire for the first time, paused, glanced in the direction of the music, and smiled, unaware that their hymn blared from the loudspeakers of a US Army psychological operations unit attached to the regiment.

Interview by 2nd Marine Division

at holding areas behind advancing Marines, quickly popping up and eliminating Iraqi armored vehicles and strongpoints. Particularly effective at eliminating enemy tanks were the laser-guided Hellfire missiles carried by AH-1Ws, with target designation provided by spotters with front-line infantry.

Joint Forces Command - East

In the east, JFC-E began moving at 0800 and cut six lanes through the first obstacle belt. The 8th and 10th Saudi Mechanized Brigades secured their respective objectives during the initial attacks. JFC-E secured all its initial objectives by the end of the first day, capturing large numbers of Iraqis. The 2nd SANG Brigade continued a reconnaissance in force along the coastal highway.

Theater Reserve

The 1st Cavalry Division, as theater reserve, conducted feints into the tri-border area while standing by to assist JFC-N east of the Wadi Al-Batin.

Supporting Operations

On 24 February, as ground offensive operations began, integrated air, sea and SOF operations continued. While maintaining air supremacy and continuing to attack selected strategic targets, air operations increasingly shifted to interdiction and CAS, which represented more than 78 percent of the combat sorties on 24 February. Even when weather reduced the availability of direct CAS missions,

interdiction missions continued to isolate Iraqi forces in the KTO and attack the Republican Guards.

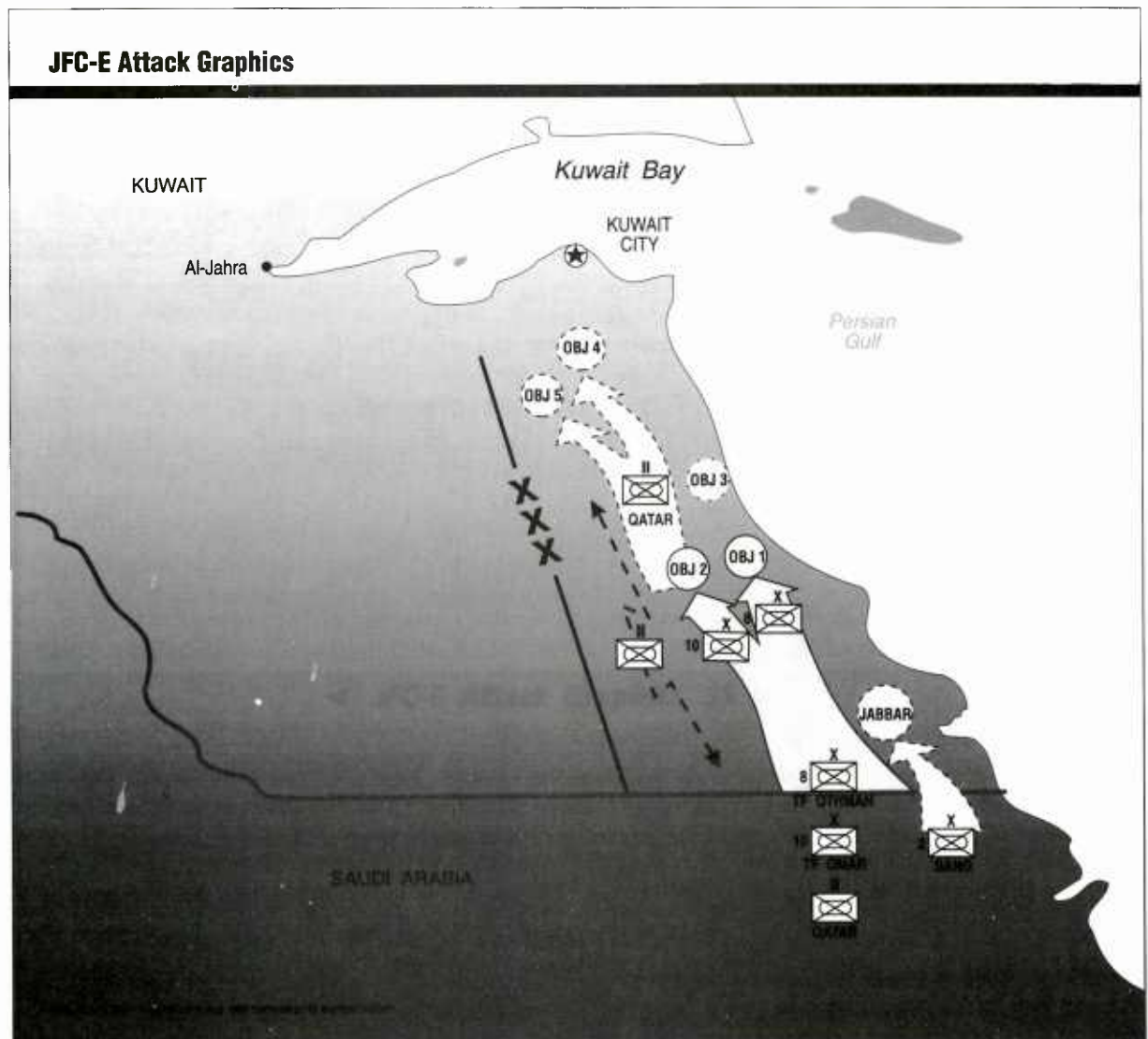


Figure VIII-37

JFC-E received fire support from the 16-inch guns of the *USS Missouri* and *USS Wisconsin*. The Navy continued strike operations, fighter cover, Gulf Combat Air Patrol (CAP), armed reconnaissance, countermine operations and surface surveillance missions in support of ground forces and the theater campaign.

Before dawn on 25 February, 4th MEB helicopters conducted an amphibious feint off Ash Shuaybah to hold Iraqi forces along the coast. Simultaneously, SEALs conducted beach reconnaissance and detonated charges to the south. Other Naval Special Warfare (NSW) units entered Kuwait City with returning Kuwaiti resistance fighters. These elements were to prepare to link up with Coalition ground forces entering Kuwait City later in the operation.

G + 1 (25 February) – Destruction of Enemy Tactical Forces

Enemy Actions and Disposition

As the ground offensive progressed, Iraqi units' ineffectiveness became more clear. The Iraqi III Corps units had suffered severe damage. CENTCOM assessed the Corps' 7th, 8th, 14th, 18th, and 29th Infantry divisions, in the I MEF and JFC-E zones, as combat ineffective and the Iraqi 5th Mechanized Infantry and the 3rd Armored divisions of III Corps as badly mauled.

On the western side of III Corps, the 14th and 7th Infantry divisions in front of I MEF were combat ineffective. The 36th Infantry, 1st Mechanized Infantry, and the 56th Armored Brigade established hasty defensive positions south/southwest of Al-Jahra, northwest of Kuwait City. The Iraqi 3rd Armored Division was trying to hold blocking positions between Kuwait International Airfield and Al-Jahra.

On the eastern side of III Corps, the 18th and 8th Infantry divisions, in front of JFC-E, were assessed as combat ineffective, although they offered stiff resistance against JFC-E forces near Mina As-Sa'ud. The 29th Infantry Division, withdrawing to the east, also was combat ineffective.

The Iraqi 19th, 11th, and 15th Infantry divisions and three SF brigades in Kuwait City were assessed at full strength. These divisions continued to focus on an amphibious assault and prepare for military operations in Kuwait City.

The deep penetration of Coalition forces in the western side of the III Corps prompted several Iraqi battalion-size counterattacks from divisions along the flanks of the penetration. These units took heavy losses.

In the IV Corps area of western Kuwait, in front of I MEF and JFC-N, the Iraqi 20th and 30th Infantry divisions were assessed as combat ineffective by the end of the first day of the ground offensive. The 21st and 16th Infantry divisions appeared to be falling back to a defensive line south and west of 'Ali As-Salim Airfield. The 6th Armored Division, west of 'Ali As-Salim Airfield, was heavily reduced.

By the end of G + 1, five VII Corps infantry divisions, one in US VII Corps zone in the tri-border area, were in jeopardy of being isolated on the front lines. The 12th

Armored Division, in front of the 1st UK Armoured Division, was engaged with Coalition armored forces as it attempted to maintain a LOC for the 47th, 27th, and 28th Infantry divisions along the US VII Corps eastern flank. From west to east in front of the VII Corps, the 48th, 25th, 26th, 31st, and 45th Infantry divisions were engaged by VII Corps armored and mechanized infantry divisions and rendered combat ineffective.

By the end of G + 1, the Iraqi forward corps were assessed as combat ineffective – no longer capable of conducting a coherent defense in sector. It was apparent the Iraqi corps commanders could not see the battlefield and did not understand the scope and intent of Coalition ground forces operations. The IV Corps could use forces in a limited counterattack, but was unable to offer more than isolated pockets of resistance. Iraqi front line forces had been outmaneuvered by the Coalition ground offensive. Baghdad Radio, at this point, reported that Saddam Hussein had ordered his forces to withdraw from Kuwait.



Figure VIII-38
British Forces Pause Momentarily during the Advance North

G + 1 - 25 February

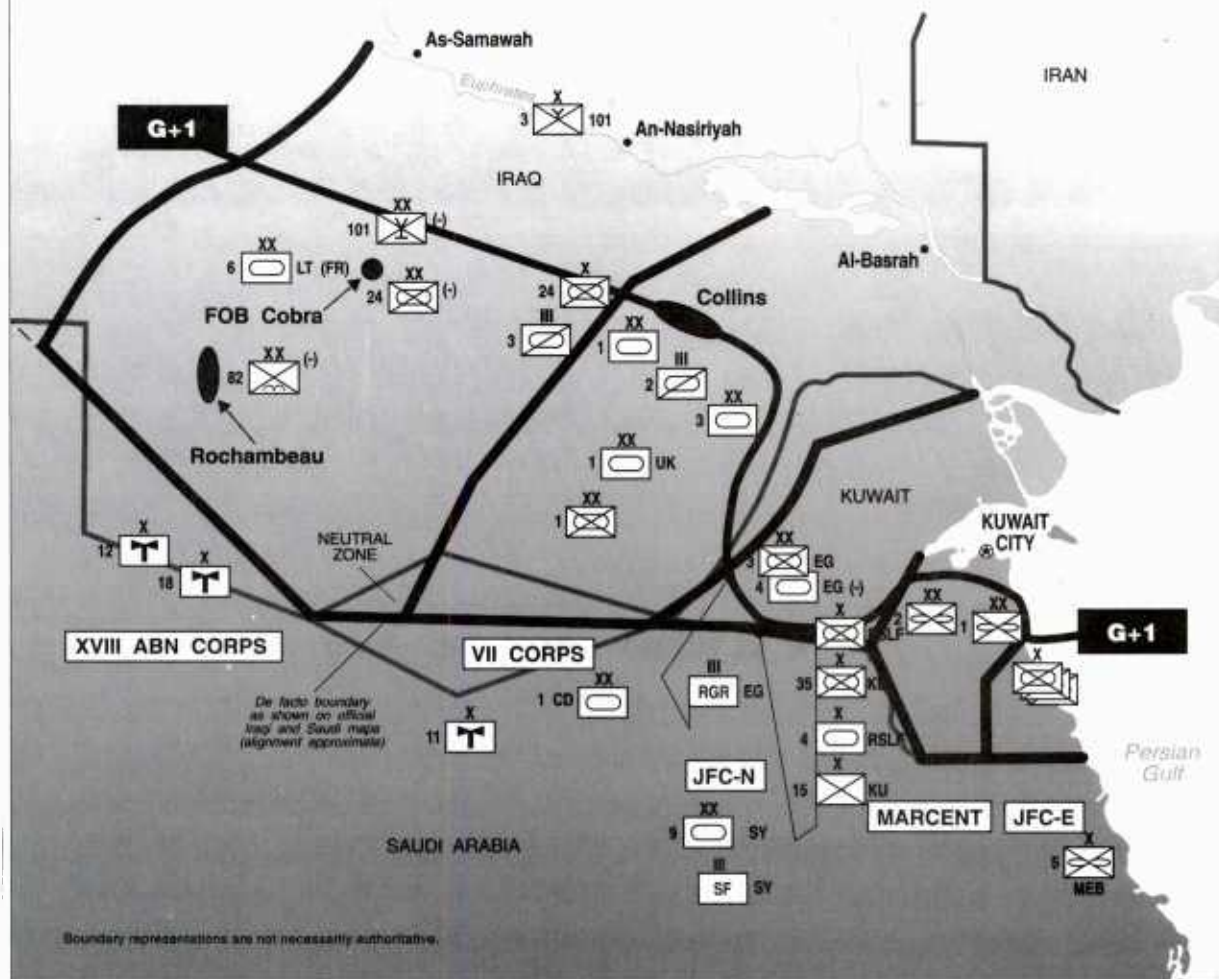


Figure VIII-39

Army Component, Central Command

In the west, XVIII Airborne Corps continued to drive into Iraq to interdict LOC and isolate Iraqi forces. The 82nd Airborne Division followed the 6th French Light Armored Division along Phase Line Smash. As the 82nd Airborne Division entered

FOB Cobra, the 101st Airborne Division (Air Assault) sent its 3rd Brigade on the deepest air assault in military history. The 3rd Brigade air assaulted north from its TAA along the Saudi-Iraqi border 175 miles to occupy observation and blocking positions on the south bank of the Euphrates River, just west of the town of An-Nasiriyah and a few miles north of the Iraqi air base at Tallil.

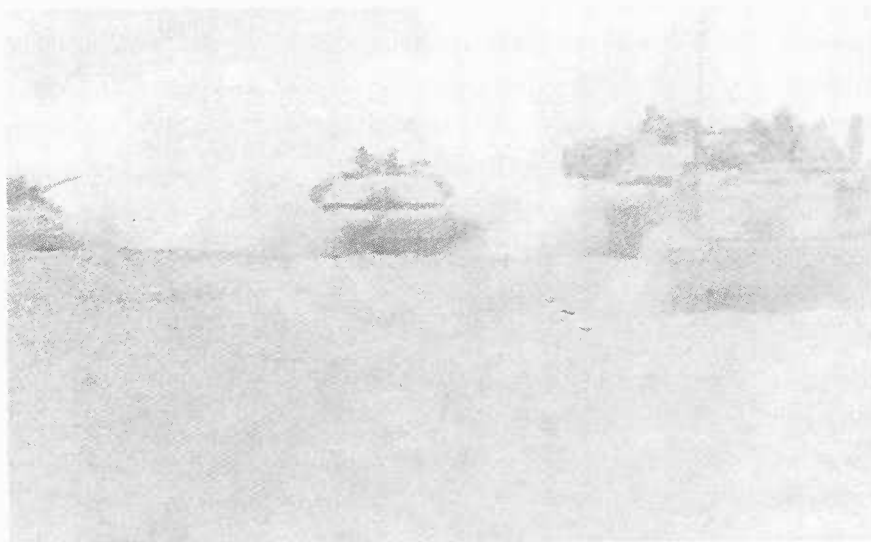


Figure VIII-40
M1 Abrams Tanks Move Forward while Vulcan (SP)
Provides Air Cover

In the early morning the same day, the 24th Infantry Division (Mechanized) moved toward its first major objective. At 0300 hours the 197th Infantry Brigade attacked Objective Brown, in the western part of the division sector. The brigade found hungry prisoners, dazed by the heavy artillery preparation. By 0700, the 197th secured its objective and established blocking positions to the east and west along MSR Virginia. Shortly thereafter, the 2nd Brigade, 24th Infantry Division (Mechanized) attacked Objective Grey, encountering no enemy fire and capturing 300 prisoners; it also established blocking positions to the east. 1st Brigade, 24th Infantry Division (Mechanized) continued northwest in the center of the division sector and attacked and secured Objective Red.

The 24th Infantry Division (Mechanized) had taken three major objectives and hundreds of prisoners against weak resistance from the Iraqi 26th and 35th Infantry divisions. By the end of the day, XVIII Airborne Corps had advanced in all division sectors, established an FOB, placed brigade-size blocking positions in the Euphrates River Valley, and taken thousands of prisoners.

XVIII Airborne Corps

25/26 FEB (G + 1/2)

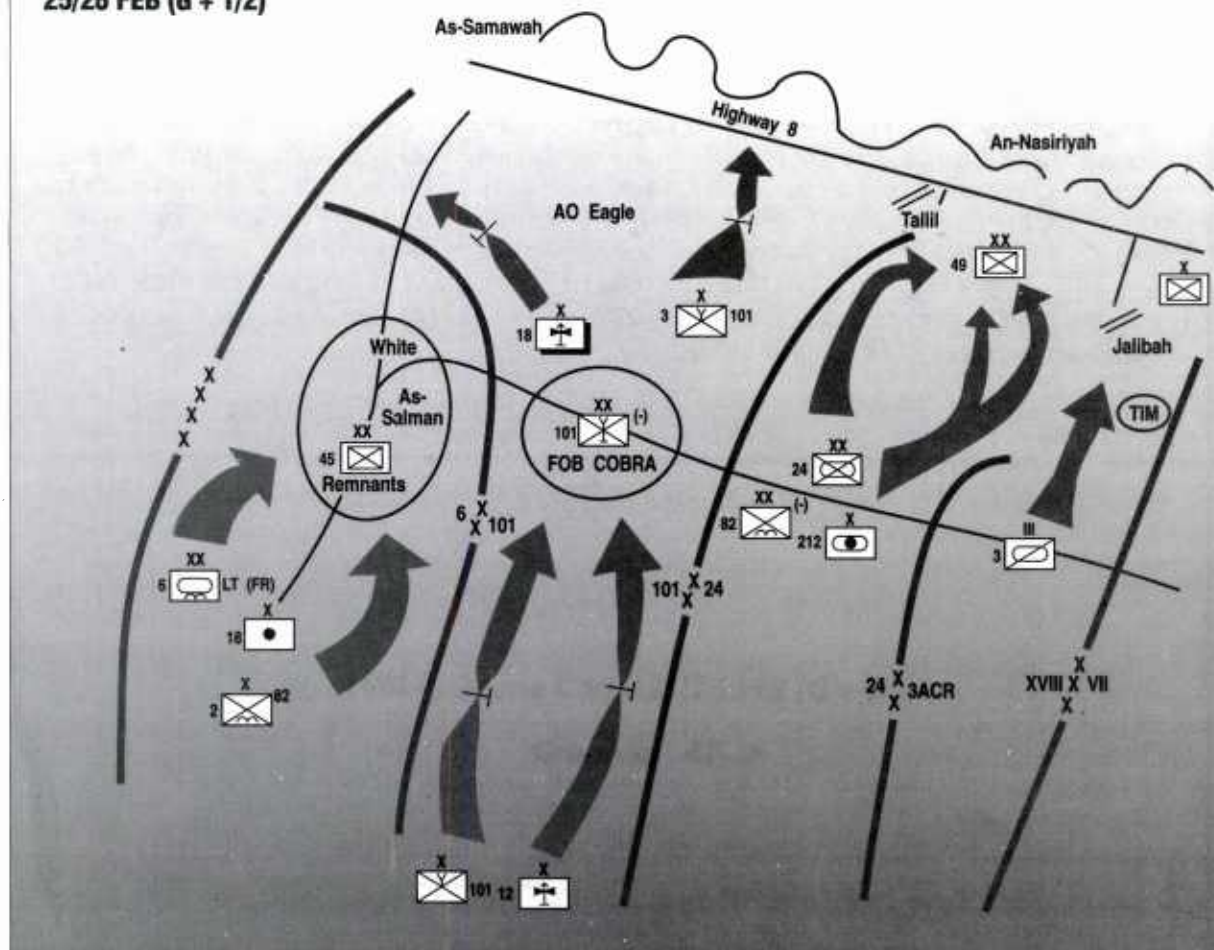


Figure VIII-41

On the VII Corps left flank, the 1st Armored Division resumed its attack shortly after daybreak and made contact first with units of the Iraqi 26th Infantry Division. While the division was about 35 to 40 miles from its objective, CAS strikes began, followed by attack helicopter strikes. As it approached the objective, artillery, rocket launchers, and tactical missile batteries delivered preparatory fires. When Division lead elements came into visual range, PSYOP teams broadcast surrender appeals. However, the Iraqis attempted to mount an attack, and a brigade of the 1st Armored Division reported destroying 40 to 50 tanks and armored personnel carriers of the Iraqi 26th Infantry Division in 10 minutes at a range of 2,000 meters.

"As troopers from the 82nd Airborne Division advanced to the valley, they were faced with a unique challenge. The commander of the 1st Battalion (Airborne), 505th Infantry, relates: 'The 3rd Brigade's mission largely was to secure Tallil Airfield and destroy enemy aircraft. A major concern in securing the airfield was the local civilians, many of whom were engaged in battling Saddam's army themselves. Our charter was to capture and destroy weapons. We had to be careful we didn't have any confrontations with the local peasants or with the resistance fighters. After a couple of days, you got to know who was who on the resistance fighters - who you could trust and who you couldn't. Soon, the area became a major treatment center for Iraqi refugees.' 'We treated well over 1,000 civilians who were fighting with the resistance,' said a 3rd Brigade medical NCO. 'They were pretty messed up. I've seen every kind of combat wound that you could imagine - everything, it was there.'"

Army Times, 21 October 1991



Figure 42
Typical Result of Tank Hit on Iraqi Armor. (Iraqi turret in foreground)

Approaching Al-Busayyah in early afternoon, the 1st Armored Division directed CAS and attack helicopter sorties to the Iraqi brigade position, destroying artillery pieces, and several vehicles, and taking almost 300 prisoners.

"A sergeant of D Company, 1st Battalion, 35th Armor, commented: 'At 2,800 meters, the tankers engaged tanks. I watched Iraqi tank turrets flip 40 feet into the air, and was dumbfounded. I was amazed by how much firepower we had, how much destruction we could do. It was a sobering thought.'"

Army Times, 16 September 1991

During this attack, the two companies of 3/1 Attack Helicopter Battalion encountered minimal resistance in the form of T-55 tanks and BMPs, which they destroyed. The surprising aspect of this operation was that it was the first of many instances where hundreds of Iraqi soldiers ran out of their bunkers and attempted to surrender after seeing Army helicopters in their midst. Without the means to hold them, the aeroscout pilots played "cowboys" to the "herd" of Iraqi soldiers, hovering them into a tight circle until the lead ground elements of the Division's 1st Brigade arrived and secured them.

Contributed by the US Army Aviation Center



*Figure VIII-43
Apache Helicopter Prepares for a Mission*

In the 1st Infantry Division sector, the 1st UK Armoured Division passed through the breach lanes the 1st Infantry Division had opened. While the 1st Infantry Division expanded the breach by defeating enemy brigades to the front, the British turned right to hit the Iraqi 52nd Armored Division. That easterly attack by the British marked the start of nearly continuous combat for the "Desert Rats" during the next two days.

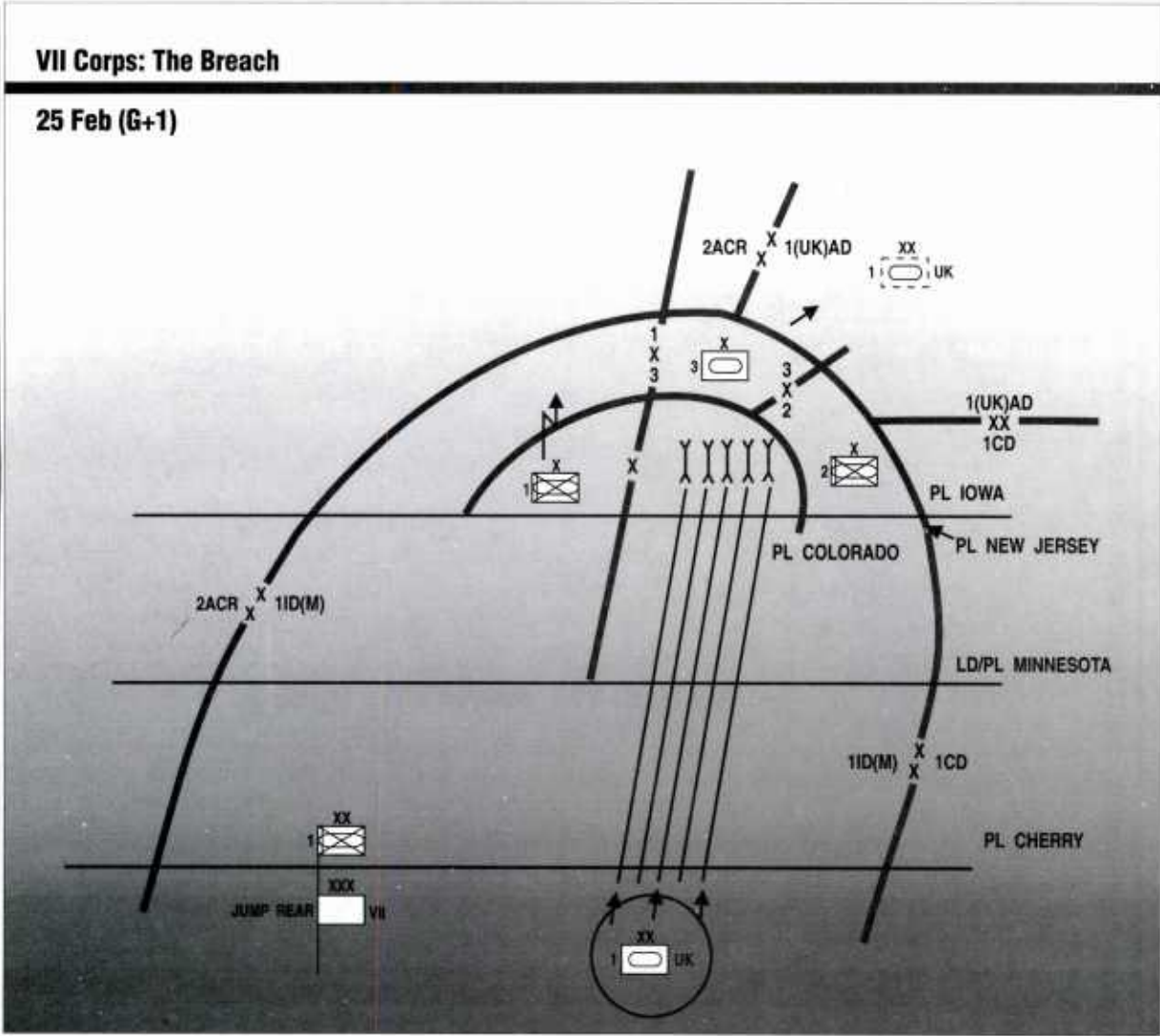


Figure VIII-45

Joint Forces Command - North

JFC-N, in the center, continued to advance. At approximately 0400 hours the Egyptian forces continued their breaching operations and advanced towards their initial objectives. The Egyptian Corps had secured a 16-square kilometer bridgehead, but their objective had not been secured by the early hours of 26 February. TF Khalid continued breaching obstacles and advanced toward its objectives early on 25 February. By the end of the day, the Saudis and Kuwaitis on the right flank had seized their objective and consolidated positions. Other units, including the 9th Syrian Armored Division followed and supported. The Syrian reconnaissance battalion continued to screen along the border between JFC-N and MARCENT.



Figure VIII-46
M1 Abrams Tanks Move Forward in the Attack

I Marine Expeditionary Force

On G + 1, I MEF advanced against the fiercest resistance it encountered during the ground offensive. In the 2nd MARDIV sector, an Iraqi armored counterattack was repulsed by the 6th Marine Regiment using a combination of CAS, artillery, tanks, and TOW missiles. Attacked by aircraft as they formed for the attack south of Kuwait City, the Iraqis were reduced to less than brigade strength by the time they actually attacked the regiment. Attacking on schedule, the 2nd MARDIV, with the Tiger Brigade on the left, 6th Marines in the center, and 8th Marines on the right, advanced against elements of the Iraqi 3rd Armored Division and 1st Mechanized

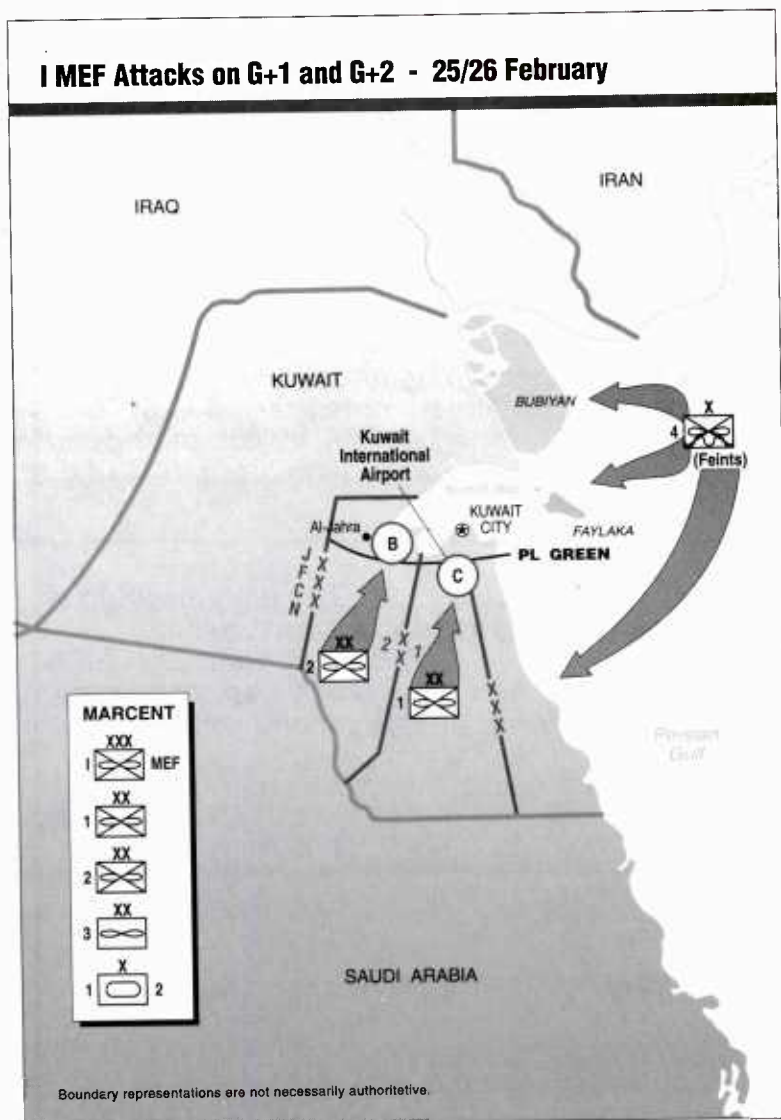


Figure VIII-47

Division that had assumed defensive positions on the high ground to the north and northwest and in an area of buildings and fences known as the "ice-cube tray". Weather combined with intense smog from burning oil wells reduced visibility to a few yards. Fighting in near darkness, Marine M1s of the 2nd Tank Battalion (supporting the 8th Marines) and the Tiger Brigade, equipped with the M1A1 and enhanced optics, proved particularly successful at engaging armor at long ranges. Other Marine tank crews, in M60A1 tanks, relied on crew skill to outfight the enemy. In the "ice-cube tray", tanks and infantry cleared buildings and trenches at close ranges in the darkness, finally securing the area after 2200 against stiff resistance.

On the right of the I MEF sector, the 1st MARDIV encountered a strong counterattack near the Al-Burqan Oil field which, at one point, was fought within 300 meters of the division CP. It lasted several hours, and involved close combat.

AH-1W and AV-8B maneuvered in conjunction with tanks and LAV to overwhelm the enemy thrust. One FAC found himself controlling the simultaneous attacks of eight different aircraft. At times the fighting became so confused that Marine and Iraqi units intermingled. One Iraqi tank commander drove his tank up to the TF Papa Bear Command Post and surrendered. In the end, the attacking formations were destroyed. In this type of fighting, GPS and thermal imaging systems proved their worth, as did training and discipline. The final tally of the battle (according to 1st MARDIV) included more than 100 Iraqi armored vehicles destroyed and at least 1,500 EPWs. The 1st MARDIV completed consolidation of Ahmad Al-Jabir airfield and pushed to within 10 miles of Kuwait City.

Silver Star citation of a Marine Corporal: *"The next morning [G + 1], the enemy counterattacked . . . with tanks and infantry. Acting immediately and with no regard for his personal safety, the Corporal grabbed an AT-4 and moved forward through thick smoke and automatic weapons fire. Sighting a tank, he worked himself close to its right flank, fired, and singlehandedly destroyed the tank."*

I MEF Award Citation

Joint Forces Command - East

JFC-E secured its objectives against light resistance and with very few casualties; however, progress was slowed by the large number of Iraqis who surrendered. TF Omar and Othman continued their advance toward their objectives. The 2nd SANG Brigade continued its advance along the coastal highway and assigned one battalion to escort EPW to the rear. Qatari units followed TF Omar as the JFC-E reserve.

Supporting Operations

With the Coalition ground advance well under way, a Navy amphibious force made its final effort to convince the Iraqi command that CENTCOM would launch a major over-the-beach assault into Kuwait. Beginning late on 24 February and continuing during the following two days, the Navy landed the 5th MEB, a 7,500-

man force at Al-Mish'ab which was attached to MARCENT as the I MEF reserve. An ATF also conducted strike missions against Faylaka and Bubiyan islands, along with simulated Marine helicopter assaults and artillery raids along the Kuwaiti coast. Feints and demonstrations by Navy and US amphibious forces off the coast tied down up to 10 divisions. Both the *USS Missouri* and *USS Wisconsin* continued to provide NGFS for I MEF and JFC-E. The 4th MEB remained afloat, ready for commitment. 4th MEB also conducted air strikes against Faylaka Island and continued to carry out amphibious feints along the coast at Bubiyan Island.

Coalition air forces flew a record number of sorties – 3,159, of which 1,997 were direct combat missions. Priority missions remained counter air, CAS, and interdiction. USMC air priority went to ground forces with second priority to targets further inside Iraq. In the early morning hours, Iraqi 3rd Armored Division elements, massing west of Kuwait International Airport, were caught in the open. Air strikes destroyed the force's counterattack potential, eliminating an obstacle to the rapidly advancing ground forces.

SOF conducted SR patrols that reported enemy dispositions. SOF liaison teams remained with Coalition units and continued to advise and support these forces in battle.

G + 2 (26 February) – Destruction of 2nd Echelon Operational Forces and Sealing the Battlefield

Enemy Actions And Disposition

During this period, the massive exodus of Iraqi forces from the eastern part of the theater began. Elements of the Iraqi III Corps were pushed back into Kuwait City by I MEF and JFC-E. They were joined by Iraqi occupation troops from Kuwait City. Iraqi units became intermingled and disordered. During the early morning of 26 February, military and commandeered civilian vehicles of every description, loaded with Iraqi soldiers and goods looted from Kuwait, clogged the main four-lane highway north from Kuwait City. To deny Iraqi commanders the opportunity to reorganize their forces and establish a cohesive defense, these forces were struck repeatedly by air attacks.

Although many Iraqis surrendered, some did not. There were several intense engagements, particularly with the Republican Guards. But by sunset on G + 2, Coalition forces had pushed hundreds of miles into Iraq; DIA assessments reflected that they captured more than 30,000 EPW; destroyed or rendered combat ineffective 26 of 43 Iraqi divisions; overwhelmed the Iraqi decision making process and rendered its C2 ineffective; and forced the Iraqi Army into full retreat.

Army Component, Central Command

XVIII Airborne Corps turned its attack northeast and advanced into the Euphrates River Valley. With the 6th French Light Armored Division, the 101st Airborne Division (Air Assault) and 82nd Airborne Divisions protecting the western and northern flanks, the 24th Infantry Division (Mechanized) led the Corps attack into the valley. Weather became a factor at this point in the offensive; a dust storm in the objective area kicked up thick clouds of swirling dust. The 24th Infantry Division (Mechanized) moved out at 1400, with three brigades heading toward the Iraqi airfields at Jalibah and Tallil. During these attacks, the 3rd ACR screened the division's southern and eastern flanks and the 24th Infantry Division (Mechanized) encountered its heaviest resistance of the war.

The Iraqi 47th and 49th Infantry divisions, the Republican Guard Nebuchadnezzar Infantry Division, and the 26th Commando Brigade stood and fought. The terrain gave them a clear advantage. Iraqi artillery and automatic weapons were dug into rocky escarpments. For four hours, the 1st Brigade of the 24th Infantry Division (Mechanized) received intense tank and artillery fire. The division reported that American artillery crews located enemy batteries with Firefinder radars and returned three to six rounds for every round of incoming, destroying six Iraqi artillery battalions.

In the dust storm and darkness, American technology gave the US forces a clear advantage. Tank, infantry fighting vehicle, and attack helicopter crews worked so well together that they could spot and hit Iraqi tanks at ranges over 3500 meters long before the Iraqis saw them. Precise tank gunnery, M-19 automatic grenade launcher fire from the fighting vehicles and armored personnel carriers, overwhelming artillery, rocket, and AH-64 support took the 24th Infantry Division (Mechanized) through the enemy armor and artillery units. This combination of superior weaponry and technique forced Iraqi troops out of their bunkers and vehicles. They surrendered in droves.

After a day and night of hard fighting, all three brigades of the 24th Infantry Division (Mechanized) were poised just south of the airfields. The 6th French Light Armored Division secured and cleared all of its objectives and moved to protect the theater left flank. The 82nd Airborne Division continued to perform rear area security, especially protection of the MSRs. The 101st Airborne Division (Air Assault)'s 3rd Brigade continued to interdict the main LOC between Baghdad and the KTO and planning began to move its 2nd Brigade to the east to secure FOB Viper and attack the North Al-Basrah road.

The XVIII Airborne Corps had achieved all its objectives; interdicting the LOC in the Euphrates River Valley, blocking reinforcement of Iraqi forces in the KTO, and completing the envelopment of Saddam Hussein's forces in southern Iraq and Kuwait.

G + 2 - 26 February

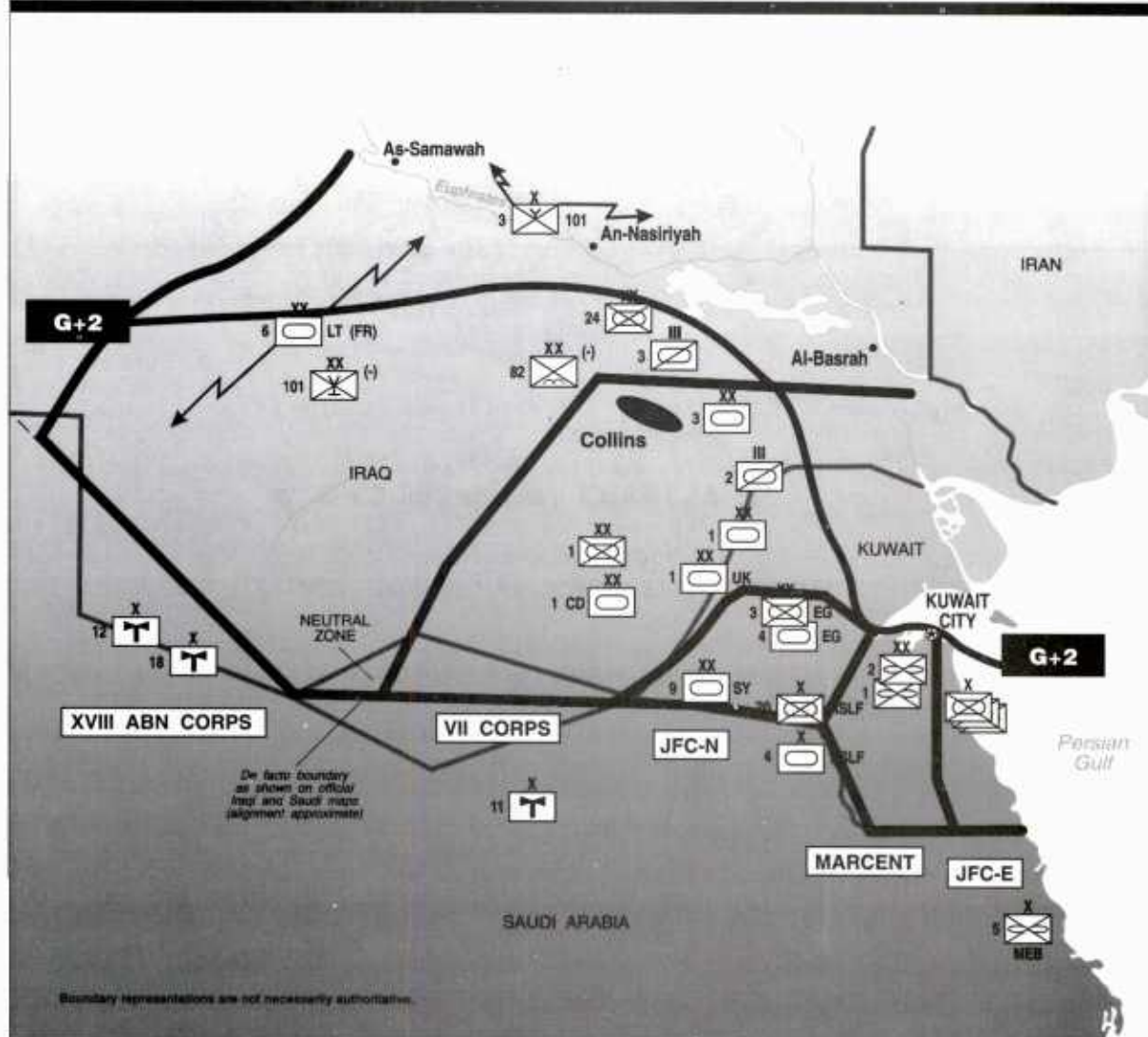


Figure VIII-48

VII Corps continued its deep envelopment into Iraq before turning right and attacking reserve units and continuing the attack to destroy the Republican Guards. CINCCENT directed VII Corps to accelerate the pace of its attack. The 11th Aviation Brigade's AH-64 Apaches made two attacks deep into Iraqi territory, one at 2100 hours, and the next at 0300 hours. These attacks destroyed significant numbers of Iraqi armored vehicles and, including air interdiction, extended VII Corps battle in depth to over 100 kilometers.



Figure VIII-49
Coalition Forces Attack on Iraqi Positions



Figure VIII-50
Soldiers from the 101st Airborne Division
(Air Assault) Operating a 105mm Howitzer

In the 3rd Armored Division zone, the division crossed Corps Phase Line Smash just after daylight, and attacked objective Collins, east of Al-Busayyah. With the capture of those objectives, VII Corps turned its advance to assault directly east into Republican Guards' strongholds.

As the attack east began, VII Corps presented in the northern part of its sector a front of three divisions and one regiment: 1st Armored Division on the left (north), 3rd Armored Division in the center, 2nd ACR and the 1st Infantry Division on the right (south). Farther south, the 1st UK Armored Division advanced on a separate axis into Objective Waterloo, and on to the junction of Phase Line Smash and the Corps boundary. The 3rd Armored Division pressed on, turning northeast, and hitting the Republican Guard Tawakalna Division. Late that night, the 1st Armored Division mounted a night assault on the elite enemy unit, and in fighting that continued into the next day, destroyed a substantial number of tanks and other vehicles.

In the early afternoon, the 2nd ACR advanced east through a sandstorm to Objective Collins. The regiment was screening in front of the 1st Infantry Division, which had just arrived after clearing the mine belt along the Saudi border. The Iraqis had long expected the American attack to come from the south and east, and were now frantically turning hundreds of tanks, towed artillery pieces and other vehicles to meet the onslaught from the west. On the Iraqi side, unit locations were changing almost by the minute. As the 2nd ACR neared Phase Line Tangerine, 20 miles east of Objective Collins, it received fire from a building on the "69 Easting," a north-south line on military maps. The regiment returned fire and continued east. They were met with more enemy fire for the next two hours. About 1600, the regiment found T-72 tanks in prepared defensive positions at "73 Easting." Using its thermal imagery equipment, the regiment destroyed every tank that appeared.

This was a different kind of battle from what Americans had fought so far. The destruction of the first tanks did not signal the surrender of hundreds of Iraqi soldiers. The regiment had found two Iraqi divisions willing to put up a hard fight, the 12th Armored and the Republican Guard Tawakalna divisions. The regiment found a seam between the two divisions, and for a time became the only American unit obviously outnumbered and outgunned during the campaign. But here again, thermal imaging equipment cut through the dust storm to give gunners a long-range view of enemy vehicles and grant the first-shot advantage. For four hours, the 2nd ACR destroyed tanks and armored personnel carriers while attack helicopters knocked out artillery batteries.

When this "Battle of 73 Easting" ended early in the evening of 26 February, the 2nd ACR reported they had destroyed at least 29 tanks and 24 armored personnel carriers, and had taken 1,300 prisoners. That night, the 1st Infantry Division (Mechanized) passed through the regiment and continued the attack east.

The evening of 26 February, the 3rd Armored Division attacked due east through an enemy reconnaissance screen and into the Republican Guards' Tawakalna Division. This attack, under extremely adverse weather conditions, was

"As the 1st Armored Division moved into the Euphrates River Valley and approached Al-Busayyah, the scene is described by members of the 6th Battalion, 6th Infantry: 'At 1500 meters, a T-55 with its turret swinging toward the advancing, US forces was spotted and destroyed, as were three others in rapid succession. We killed the tanks so quickly they didn't get a round off. A fifth tank trying to flee was taken out by an M1A1 main round. The turret flew through the air like a Frisbee. We moved up to the town expecting them to wave white handkerchiefs, and they started shooting at us.'

" 'The word was they were going to have the white flags up.' a C Co, 6/6 Inf Bradley vehicle commander said. 'We stopped about 200 meters out, started scanning for white flags, didn't see any.' He spotted a machine-gun position in a building on the left flank, and the Bradley fired 60 rounds into it, turning the building into rubble and taking out the gun.

"The commander of the battalion's C Company, reported some Iraqi soldiers coming to the edge of the town with their hands up. 'My instructions to him were have them come out to you, do not take yourself into RPG range. Immediately after they waved their hands and some shirts, they dropped back behind fortifications and started shooting at us again, so we knew we were going to have to go in and get him.'

"The battalion commander pulled his forces back and ordered the 2nd Battalion, 1st Artillery Regiment to fire a 10-minute artillery prep on the town. He then sent three companies to the east side of town, a tank-heavy security element to the north end of town to catch escaping Iraqi, and a small assault team consisting of a platoon of Bradleys, two Armored Combat Earthmovers and a combat engineer vehicle to the south side of town.

"Once the forces were in position, the three companies opened up. Fire was lifted to allow the assault team to enter from the south. They were hit by small-arms fire and the engineer vehicle opened up. Its huge 165-mm demolition gun fired 21 rounds with devastating impact. 'That totally destroyed all the resistance in the town.'"

Army Times, 16 September 1991

typical of the heavy fighting encountered by the VII Corps as it engaged Republican Guard Forces. These forces were heavily armored and occupied well constructed defensive emplacements. They had also prepared alternate positions which enabled them to reorient to the west to face the VII Corps attack. Even after extensive bombardment, most elements of the Tawakalna Division remained combat effective. Weather conditions continued to deteriorate and winds gusted from 25-

VII Corps

26 Feb (G+2)

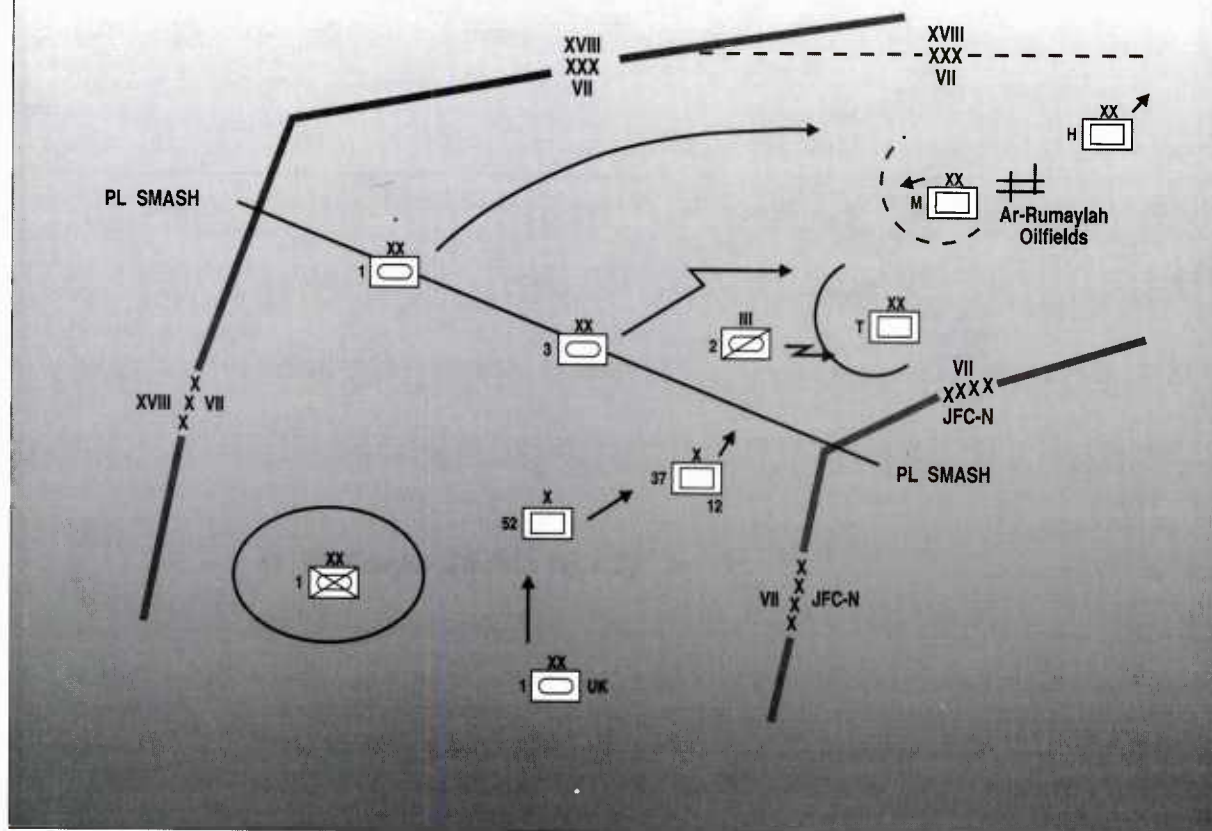


Figure VIII-51

42 knots. Heavy rain and blowing sand often reduced visibility to less than 100 meters. The ceiling was generally very low, and in the words of one senior armor commander, "neither Army aviation nor air forces could fly."

Under these conditions, the 1st and 2nd Brigades of the 3rd Armored Division simultaneously conducted a hasty attack against the 29th and 9th Brigades of the Tawakalna Division. Spearheaded by the division cavalry squadron and a tank heavy task force, supported by five battalions of cannon artillery and 27 MLRS launchers, the 3rd Armored Division succeeded in destroying numerous Iraqi armored vehicles and tanks in intense fighting. This action effectively destroyed the Tawakalna Division as a coherent fighting force. US artillery proved extremely effective in the

e during this battle. Although Iraqi artillery was able to fire initially, it geted and rapidly suppressed or destroyed.



*Figure VIII-52
Scouts of I Troop, 3rd Squadron, 2nd Armored
Cavalry Regiment Move Forward Through the
Battle Zone Inside Iraq. (Photo courtesy of Soldier
Magazine, May 1991.)*

Later in the engagement, visibility improved enough to employ the division's Apache-equipped attack battalion. In the northern portion of the division zone where the 2nd Brigade operated, the timely arrival of the Apaches (guided by intelligence from JSTARS) caught an enemy mechanized infantry task force as it moved diagonally across the brigade's sector but outside of direct fire range. Their unit was evidently attempting to reinforce other elements of the Tawakalna Division. According to unit after action reports, this engagement resulted in the destruction of eight tanks and nineteen armored vehicles.

Farther south, the 1st UK Armoured Division fought a series of sharp fights with enemy units trying to withdraw. In the largest engagement, the "Desert Rats" destroyed 40 tanks and captured an Iraqi division commander.

Released from its theater reserve mission and attached to the VII Corps, 1st Cavalry Division (Mechanized) raced to the northern limit of the VII Corps to help attack the Republican Guards.

"During battle, a Bradley scout observer in a screen line forward of an armored task force sustained severe wounds to the groin, legs, and right hand during an engagement with a T-72 tank. Two other crewman were wounded and the Bradley commander killed. Despite his wounds, the private evacuated other more severely wounded crewmen and returned to his vehicle to gather flares and a radio. Because his hand was badly wounded, he used his teeth to open a flare canister, signaled his location, and radioed a report to his platoon. Despite wounds and a burning T-72 in his immediate vicinity, the soldier continued to provide security and comfort to other wounded soldiers until relief arrived. During subsequent medical treatment, he repeatedly told medical personnel to treat fellow wounded soldiers first."

3rd Armored Division Award Citation

"The Iraqi vehicles were dug into defensive revetments that limited their fields of fire to the south and southeast. 'You could just see the top of the turret over the berm,' said a tanker. 'So I started shooting two or three feet down from the top. We were shooting sabot rounds right through the berms. You'd hit it and see sparks fly, metal fly, equipment fly.' 'We were told before the battle that you've got to hit 'em in a certain place. But, anything you shot 'em with, they blew up. Using sabot, we blew one turret out of the hole about 20 feet. It landed upside down,' said an Abrams tank commander."

Soldier Magazine, June 1991

Joint Forces Command-North

The JFC-N continued to attack, seizing its intermediate and final objectives before the evening of 26 February. Egyptian forces secured their objective near Al-Abraq and turned east, pushing 60 kilometers toward their next objective, 'Ali As-Salim airfield. The plan was to pass through the US Marine forces and liberate Kuwait City. TF Khalid secured its objectives and also turned east towards Kuwait City. The 9th Syrian Armored Division screened the Saudi border east of TF Khalid and secured JFC-N supply routes with two brigades. The 3rd Syrian brigade followed TF Khalid toward Kuwait City.



*Figure VIII-53
1st UK Armoured Division*

The ARCENT commander's nightly situation report summed up operations on the evening of 26 February: *"Impressive successes by VII Corps and XVIII Corps have also been accompanied by the challenges of an extremely rapid operational tempo and poor weather. Rain, low ceilings, and dense morning fog have limited close air support against enemy artillery and armor. Rain has also degraded trafficability of main supply routes at a time when rapid tactical advances have extended supply lines and increased sustainment demands. These conditions will not significantly hinder the attack and destruction of the RGFC."*

ARCENT Commander's Situation Report

I Marine Expeditionary Force

After refueling and replenishing during the night and early morning hours, I MEF continued to attack north on 26 February. Its objectives were Kuwait International Airport and the Al-Mutl'a Pass. The I MEF advanced with the 2nd MARDIV attacking to the northwest towards Al Jahra and the 1st MARDIV turning towards Kuwait International Airport. The Tiger Brigade headed toward Al-Mutl'a Ridge, terrain that dominated the roads leading from Kuwait City and key to cutting

off the Iraqi retreat. Occupation of these dominant terrain features would close the main road, the 6th Ring Road, from coastal Kuwait.

The Iraqi command, belatedly realizing its forces in Kuwait faced entrapment, had issued orders to begin withdrawing. It was too late. The 2nd MARDIV began the attack at 1200. In a classic example of joint operations, the Tiger Brigade, with 3rd Battalion, 67th Armor in the lead supported by USAF and USMC aircraft, smashed its way to the high ground northwest of Al-Jahra, destroyed the remaining Iraqi resistance and cutting off further Iraqi retreat. Approaching Al-Mutl'a Ridge, the brigade found a minefield and waited for the plows to cut a safety lane. Once through the minefield, the brigade began to find enemy bunker complexes and dug-in armor units. They destroyed the enemy tanks and bunkers. Moving up and over Al-Mutl'a Ridge, the brigade destroyed many antiaircraft artillery (AAA) positions and began to consolidate its position.

"As the 1st Marine Division stepped off in the attack on G + 2, it immediately ran into Iraqi T-72 tanks. The smoke from burning oil wells and bad weather had combined to reduce visibility to only a few yards. Attempts to get close air support were thwarted by this absence of visibility. Out of the darkness emerged two Marine AH-1W's, flying at ground level. Knowing the dire need of the Marines on the ground, they had literally taxied along roads, twice passing under powerlines to reach the forward units. Their Hellfire missiles quickly eliminated the Iraqi tank threat."

I MEF Award Citation

The Tiger Brigade now controlled the highest point for hundreds of miles in any direction. The roads were choked with Iraqi vehicles and armor. The previous night, aircraft had begun destroying enemy military and commandeered vehicles retreating from Kuwait on these highways. The Tiger Brigade added its firepower to the continuous air strikes. Up and down the multi-lane highways were hundreds of burning and exploding vehicles of all types. The result brought the road the name "Highway of Death." Soldiers escaped from their vehicles and fled into the desert to join the growing army of prisoners.

The rest of the 2nd MARDIV reached Al-Jahra, overcoming the Iraqi rear guard dug in south of the city in quarries and dumps. The 6th Marines advanced into the quarry area, encountering stiff resistance from elements of the Iraqi 3rd Armored and 5th Mechanized divisions, some equipped with T-72 tanks. Elaborate bunkers were uncovered that housed brigade CPs, complete with kitchens and classrooms. 1st Battalion, 6th Marines advanced to the outskirts of Al-Jahra, the first Marine unit to reach Kuwait City. Relatively few prisoners were taken since the Iraqi

rearguard chose to fight rather than surrender. Hundreds of civilians were encountered for the first time in the operation.

The 1st MARDIV ran into a desperate Iraqi armored defense centered on Kuwait International Airport. With TF Papa Bear in the center leading the attack, TF Ripper on the left, and TF Shepherd on the right, the division fought into the night of 26 February, assisted by 16-inch naval gunfire from the *USS Wisconsin* and Marine CAS. Darkness and intense smoke restricted visibility to only a few yards. TF Shepard was ordered to clear the airport while the other units held up, to ease coordination. The 1st MARDIV finally seized Kuwait International Airport at 0330, 27 February. I MEF After Action Reports reflect more than 250 destroyed tanks and 70 armored vehicles were counted in or near the airport, a testament to the final Iraqi stand. By early morning on 27 February, I MEF had secured all its assigned objectives. I MEF now awaited the arrival of JFC-E and JFC-N, which would liberate Kuwait City.

Joint Forces Command - East

Coalition forces continued operations well ahead of schedule, meeting generally light resistance. TF Omar continued its attack in the western sector reaching its objectives. The Qatari battalion pressed forward and also secured its objectives south of Kuwait City, as did TF Othman. The UAE motorized infantry battalion screened the 10th RSLF Mechanized Brigade's left flank. JFC-E was so successful that its western boundary was changed twice, and it was given four additional objectives. By day's end, preparations were made for a Pan-Islamic force to enter Kuwait City on 27 February.

Supporting Operations

Air Force Special Operations Command (AFSOC) and Army helicopters from 160th Special Operations Aircraft Regiment (SOAR) recovered SF teams from western Iraq. AFSOC PSYOP EC-130's flew numerous missions dropping leaflets and broadcasting prerecorded messages for Iraqi forces to surrender or be destroyed.

Despite the adverse weather, Coalition air crews continued the destruction of vehicles, artillery pieces and fortifications. Support of ground operations took on increased importance in an effort to destroy the Iraqi forces in the KTO.

As I MEF advanced, 3rd MAF fixed- and rotary wing aircraft continued to push forward. A large percentage flew interdiction missions as the MEF attempted to eliminate resistance before it could disrupt advancing ground units. Directed by airborne FACs, attack aircraft, some of whom flew from amphibious ships offshore,

blocked the bottleneck formed by the Al-Mutl'a Pass. This action was instrumental in the destruction of major elements of the retreating enemy force.

G + 3 (27 February) – Destruction of the Republican Guards

Coalition forces pressed the attack on the night of 26 February and pursued the Iraqi forces throughout 27 February against disintegrating resistance.

Enemy Actions and Disposition

By the end of G + 3, 33 Iraqi divisions were assessed by DIA as combat ineffective. Only isolated pockets of Iraqi forces remained in Kuwait. Most Iraqi Army units had surrendered, been destroyed, or were retreating. Many retreating units abandoned their equipment as they fled toward Al-Basrah. Coalition forces were involved in several brisk engagements with the RGFC; however, these remaining RGFC elements were operating independently and could no longer conduct cohesive operations.

West and south of Al-Basrah, remnants of Iraqi operational and theater reserve forces attempted to defend against heavy pressure from the Coalition. Remaining elements of the 10th Armored Division linked up with the remains of the RGFC Al-Madinah Division just north of the Iraq-Kuwait border and attempted, unsuccessfully, to defend against advancing US forces. To the west of the city, elements of the RGFC Hammurabi Armored Division with scattered elements of RGFC infantry divisions continued to defend under heavy pressure from advancing Coalition forces. Some parts of these units succeeded in escaping across the Euphrates River. DIA estimates that upwards of 70,000 to 80,000 troops from defeated divisions in Kuwait may have fled into the city of Al-Basrah.

Army Component, Central Command

On the morning of 27 February, XVIII Airborne Corps was prepared to continue its advance east toward Al-Basrah. But before the assault could be resumed, the 24th Infantry Division (Mechanized) had to secure the Euphrates River Valley by taking two airfields still in Iraqi hands. Tallil airfield was about 20 miles south of the of An-Nasiriyah and Jalibah airfield lay farther east, near the lake at Hawr Al-Milh. The mission of taking these two airfields went to the units which had ended the previous day in positions closest to them. 1st Brigade would support the

G + 3 - 27 February

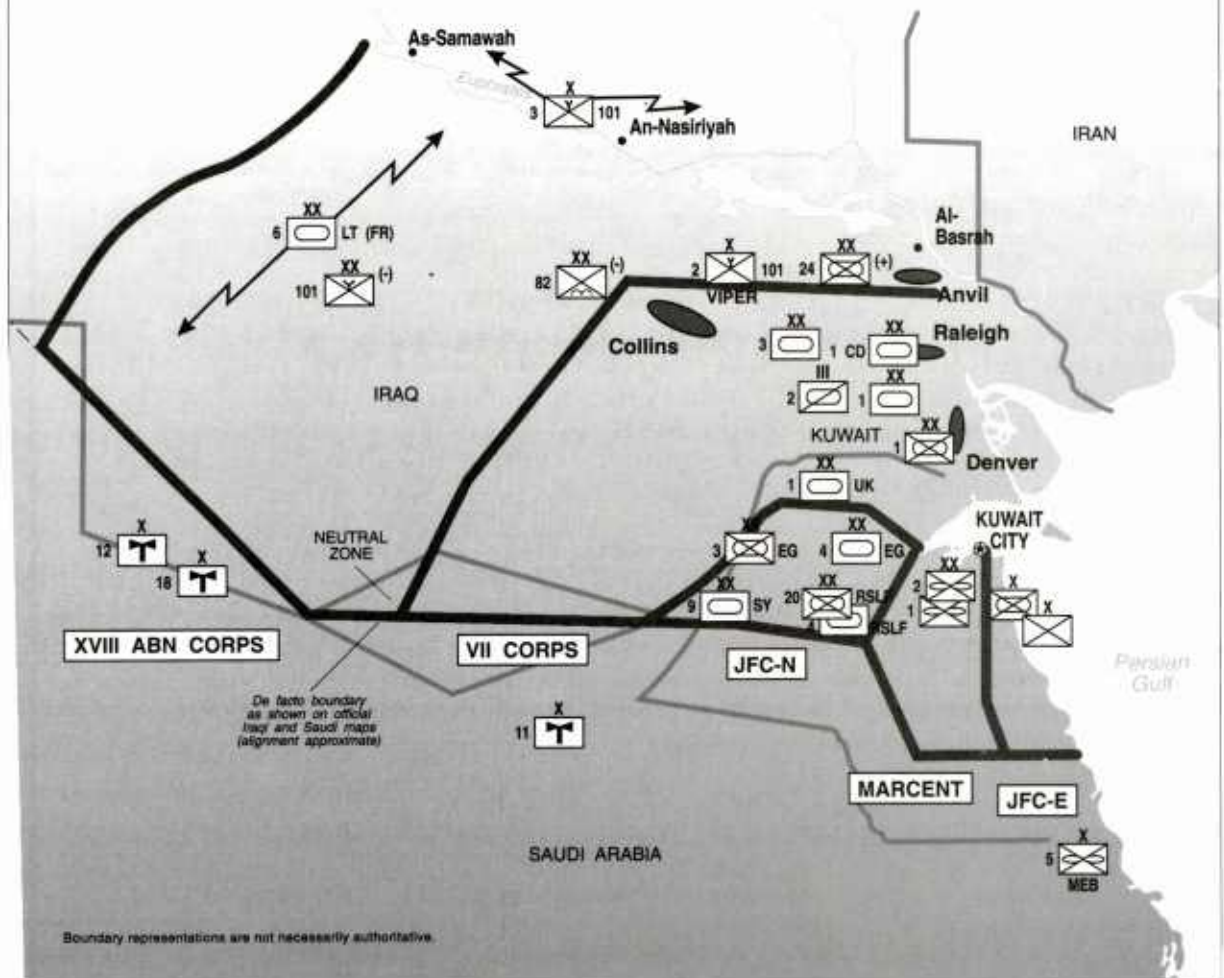


Figure VIII-54

2nd Brigade's attack on Jalibah airfield. The 197th Infantry Brigade, moving north, would take Tallil.

However, before attacks against the airfields could begin, a supply problem had to be solved. The 24th Infantry Division (Mechanized) had moved so fast in two days that fuel tankers were having difficulty keeping up. After halting during the

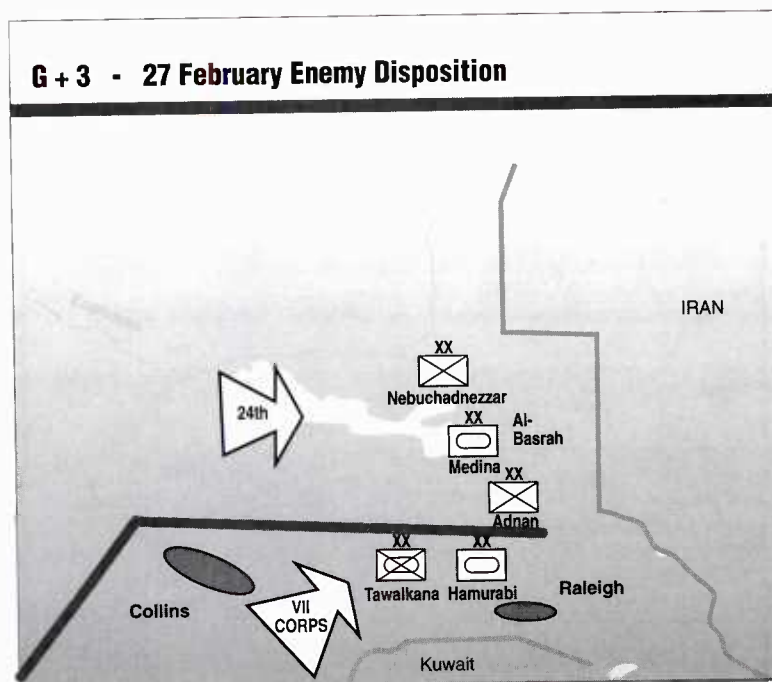


Figure VIII-55

night of the 26 February, the lead tanks had less than 100 gallons of fuel in their 500-gallon tanks. Replenishment fuel was with the brigade trains, but lead elements were not sure where to rendezvous in the desert. Through the initiative of a number of junior officers, the leaders managed to refuel the 24th Infantry Division (Mechanized) vehicles by midnight on 26 February. At 0600 27 February, 1st Brigade moved east; by 1000, Jalibah airfield was secured.

At 1200, the first XVIII Airborne Corps and 101st Airborne Division (Air Assault) attack helicopter battalions closed on a new FOB Viper, 200 km east of FOB Cobra which had been secured by the 2nd Brigade, 101st Airborne Division (Air Assault) assaulting at 1000. Two attack helicopter battalions from the 101st Airborne Division (Air Assault) were first to the Al-Basrah causeway. Smoke from the burning oil wells reduced visibility to less than 1,000 meters, and it was so dark that the aircrews relied completely on thermal sights. The two battalions destroyed every moving vehicle on the causeway, scattering wreckage and blocking further movement. A second pair of attack battalions flew further north across the Al Hammar Lake and began engaging targets that had already crossed the causeway. With the last escape route now cut, most of Iraqi units were caught between advancing forces of the 24th Infantry Division (Mechanized), the VII Corps and the Euphrates River.

With the 24th Infantry Division (Mechanized) now oriented east after its northern advance, new phase lines were drawn between Tallil airfield and the Ar-

27 Feb (G+3)



The battles begun the previous afternoon continued through the morning of 27 February as VII Corps divisions bore into Republican Guard units trying to escape or reposition. As the assault gained momentum, the VII Corps, for the first time, deployed its full combat power. The 1st Cavalry Division headed north to join the VII Corps assault. By 2100, the 1st Cavalry Division was in position on the extreme left of the corps sector, tying in with the 24th Infantry Division (Mechanized) across the corps boundary. Now the VII Corps could send five divisions and an ACR against the Republican Guard. From left (north) to right, VII Corps deployed the 1st Cavalry Division, 1st Armored Division, 3rd Armored Division, 1st Infantry Division (Mechanized), 2nd ACR, and the 1st UK Armoured Division. GPS receivers helped keep unit flanks aligned with one another and helped avoid friendly engagements.

Early on 27 February, after a night of intense fighting, the 3rd Armored Division's 3rd Brigade moved through the 2nd Brigade, conducting a passage of lines while in contact with the enemy. This demanding maneuver required extensive coordination in order to preclude inflicting casualties on friendly forces. The level of training and the high quality soldiers and leaders were crucial to the success of this maneuver. Under a supporting artillery barrage, the 3rd Brigade then attacked the Iraqi 12th Armored Division. After a sharp fight, the 3rd Brigade broke through the enemy's defensive positions and drove into Kuwait.

Late in the evening on 27 February, the 3rd Armored Division again employed Apaches under adverse weather conditions and struck deep into the rear area of the enemy 10th Armored Division. These attacks behind the Iraqi lines broke the continuity of their defense and forced them to abandon both their positions and much of their equipment. Together with attacks by the 1st Infantry Division, heavy frontal pressure from the 1st and 3rd Brigades of the 3rd Armored Division, supported by MLRS fires, forced front line enemy units to retreat directly into the disorganized rear elements. This combined arms operation prevented reorganization and completed the rout of the Iraqi 10th Armored Division.

The 1st Armored Division also fought remnants of the Tawakalna, Al-Madinah and Adnan Republican Guards Divisions. The 2nd Brigade, 1st Armored Division, destroyed 61 tanks and 34 armored personnel carriers of the Al-Madinah Division in less than one hour. The 1st Infantry Division (Mechanized) overran the 12th Armored Division and scattered the 10th Armored Division into retreat. On the south flank, the 1st UK Armoured Division destroyed the 52nd Armored Division, then overran three infantry divisions. To finish the RGFC destruction, VII Corps conducted a double envelopment involving the 1st Cavalry Division on the left and 1st Infantry Division (Mechanized) on the right. The trap closed on disorganized bands of Iraqis streaming north in full retreat.

The VII Corps pressed its attack farther east. The 1st Infantry Division (Mechanized) established blocking positions on the north-south highway connecting Al-Basrah to Kuwait City. In the early morning hours of 28 February, corps artillery units fired an enormous preparation involving all long-range weapons: 155-mm and 8-inch self-propelled artillery pieces, rocket launchers, and tactical missiles. Attack helicopters followed to strike suspected enemy positions. The advance east

continued until offensive operations were halted at 0800, with VII Corps' armored divisions just inside western Kuwait.

Joint Forces Command - North

Egyptian forces closed on 'Ali As-Salim airfield. The Kuwaiti Ash-Shahid Brigade and 4th Armored Brigade (RSLF) secured Objective Hotel. Syrian units continued to handle EPWs for JFC-N. One Syrian Brigade continued to secure the JFC-N LOC. Another Syrian Brigade, screening the Saudi border moved northeast to join the rest of the division. A brigade size force entered Kuwait City and prepared to occupy the western part.



Figure VIII-58
Coalition Forces Move North

I Marine Expeditionary Force

In the I MEF sector on 27 February, the 2nd MARDIV began the fourth day of the ground war by holding positions and maintaining close liaison with JFC-N units on the left flank. At 0500 27 February, Tiger Brigade troops made contact with Egyptian units, and four hours later JFC-N columns passed through the 2nd Marine Division. The Division remained on Al-Mutl'a Ridge and Phase Line Bear until offensive operations ended at 0800 28 February. To the east, 1st MARDIV consolidated its area, clearing the last pockets of resistance from near Kuwait International Airport and linking up with JFC-E units advancing along the coast.

Two small, but symbolic, incidents occurred on this final day of combat. Twelve Marines from the 2nd Force Reconnaissance Company infiltrated into Kuwait City in the early morning darkness of 27 February, to be greeted by jubilant Kuwaitis and American flags waving from buildings, despite sporadic fire from Iraqi stragglers. In Al-Jahra, a Marine officer slipped into the city on the afternoon of 27 February to contact the Kuwaiti Resistance, which was battling Iraqi rear-guard forces and stragglers. After conducting a reconnaissance patrol of key facilities in the city in the company of six well-armed Kuwaiti resistance fighters, he found himself the guest of honor at a dinner celebrating the liberation of Kuwait.

Joint Forces Command - East

JFC-E's offensive actions secured final objectives south of Kuwait City. Forward elements continued into Kuwait City and linked up with JFC-N forces which were entering Kuwait City from the west. JFC-E forces began to occupy the eastern part of Kuwait City.

Supporting Operations

Coalition air forces continued to provide air interdiction (AI) and CAS in adverse weather. A-10s and F-16s flew from bases in Saudi Arabia during the day while F-15Es and LANTIRN-equipped F-16s attacked during the night. Carriers in the Gulf provided A-6s, A-7s and F/A-18s to strike targets beyond the fire support coordination line (FSCL). F/A-18s and A-6s from Bahrain and forward-based AV-8Bs attacked targets and responded to requests for CAS in Kuwait. AH-64s and AH-1W s provided close-in fire support for ground forces. Some aircraft flying combat missions were damaged and lost to AAA and IR missiles as deteriorating weather conditions forced aircraft to fly at lower, more vulnerable altitudes.

The 3rd MAW, still pushing AH-1W attack helicopters and attack aircraft to Marine ground units, shifted its main effort to the north, along the main highway from Kuwait City to Iraq. Joining in the effort were AV-8Bs flying from the *USS Nassau* (LHA 4) in the Gulf, the first time in Naval history that attack aircraft had conducted missions from an amphibious ship. Behind I MEF's lines, heavy lift CH-53s and medium lift CH-46Es shuttled back and forth between ground combat units and logistics bases, carrying supplies forward and returning loaded with enemy prisoners, who were shuttled to Coalition EPW compounds.

SOF recaptured the American embassy in Kuwait City as other coalition forces liberated the city and linked up with Kuwaiti Resistance forces and helped clear key government buildings. Naval Special Warfare units took the former Kuwaiti Police Headquarters and captured numerous documents depicting C2 of the Iraqi-supported terrorist campaign.

G + 4 (28 February) – Offensive Operations Cease

Army Component, Central Command

By the time offensive operations were halted, XVIII Airborne Corps had completed its advance into Iraq, cutting off Iraqi retreat and helping with the RGFC's final destruction. The 24th Infantry Division with the 3rd ACR continued its attack to the east to block enemy withdrawal and completed the elimination of the RGFC. The 82nd Airborne Division continued to clear objectives Red, Gold, and Orange. The 101st Airborne Division (Air Assault) continued operations along Highway 8 while securing FOBs Cobra and Viper and interdicting the North Al-Basrah road.

When offensive operations ended at 0800 28 February, the 24th Infantry Division (Mechanized) lead elements stood along a phase line only 30 miles west of Al-Basrah. The division established a hasty defense along the appropriately named phase line "Victory," and there the XVIII Airborne Corps advance ended.

In the VII Corps sector, VII Corps continued to attack early on 28 February to destroy elements of remaining Iraqi divisions west of Al-Basrah. 1st Armored Division attacked and secured Objective Bonn. 3rd Armored Division cleared Objective Dorset after meeting stiff resistance and destroying more than 250 enemy vehicles, then pursued remaining enemy elements towards Objective Minden. The 1st UK Armoured Division attacked to the east to clear Objective Varsity, encountering limited resistance. After attacking across the zone and destroying RGFC remnants, the VII Corps established blocking positions with the 1st Infantry Division and 1st Armored Division along the Al-Jahra/Al-Basrah MSR. 1st Cavalry Division, 1st Armored Division, 3rd Armored Division, and the 2nd ACR secured their objectives and cleared positions short of the Corps limit of advance, which was the MSR between Al-Jahra and Al-Basrah.

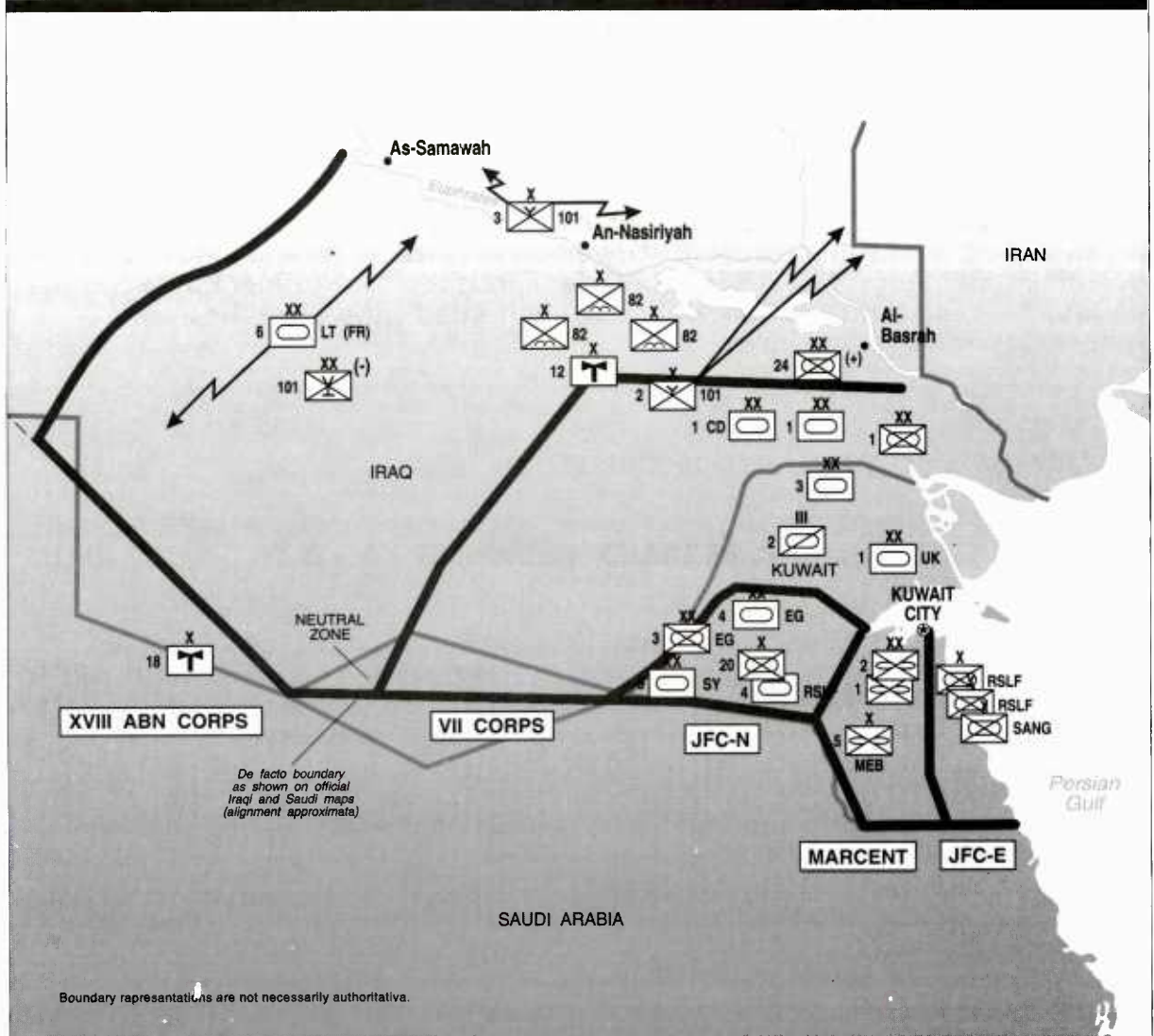


Figure VIII-59

In 90 hours of continuous movement and combat, VII Corps achieved devastating results against the best units of the Iraqi army. VII Corps reported destroying more than a dozen Iraqi divisions; an estimated 1,300 tanks, 1,200 fighting vehicles and APCs; 285 artillery pieces and 100 air defense systems; and captured nearly 22,000 enemy soldiers. At the same time, the corps had extremely light casualties and combat vehicles losses.

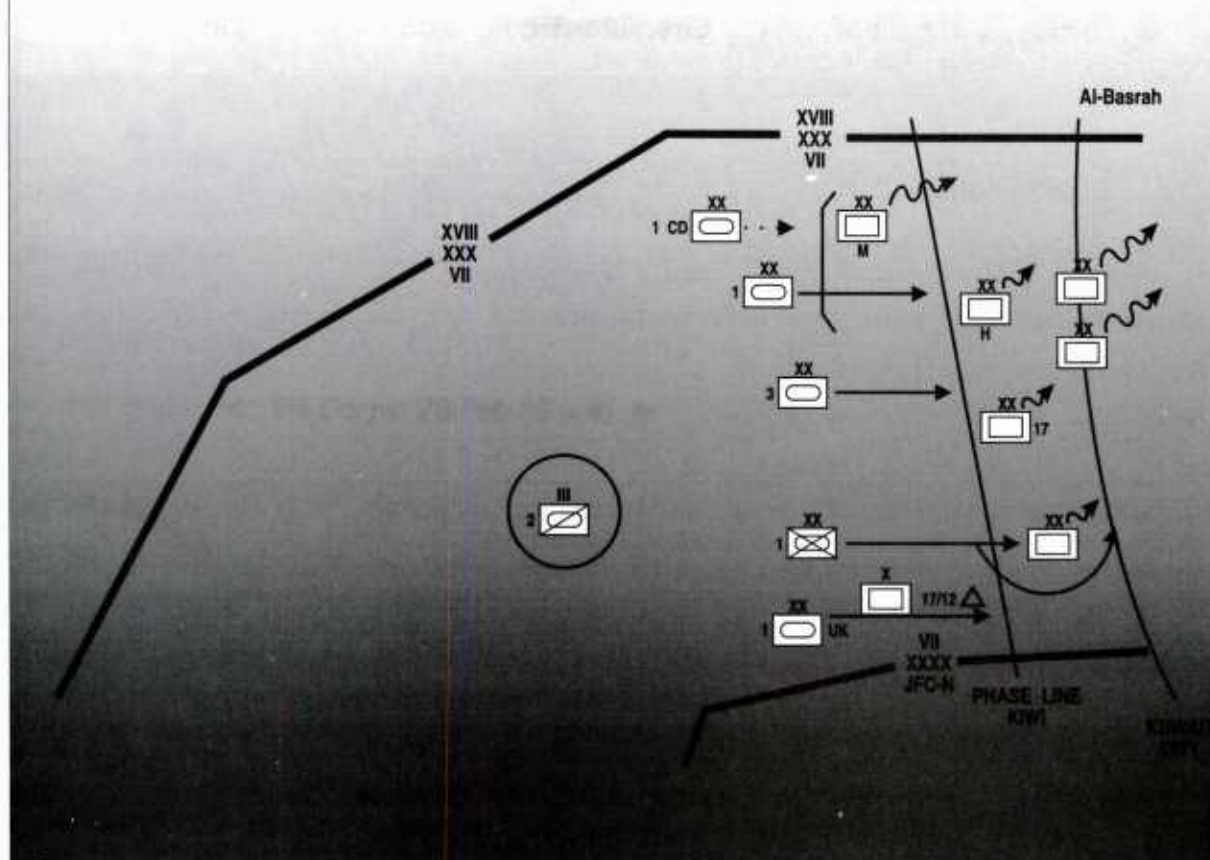


Figure VIII-60

After defeating the enemy, VII Corps focused attention on humanitarian operations as did other US units. US forces ensured that Iraqi citizens, including Iraqi military personnel, were treated compassionately and with dignity. To do this essential services were restored as quickly as possible. For example, VII Corps humanitarian support included treating almost 30,000 Iraqi civilians in military health care facilities, supplying over a million meals, and reopening the health clinic and school in Safwan. In addition, VII Corps protected 12,000 Iraqi refugees in Safwan and at a camp near Rafhah, built a camp north of Rafhah that would hold 30,000 refugees, and provided transportation for refugees who chose to leave Iraq.

Joint Forces Command - North

JFC-N ceased offensive operations, secured enemy locations in their area, and consolidated positions. Elements of the Egyptian Ranger Regiment secured the Egyptian Embassy and the 6th Brigade, 4th Egyptian Armored Division began clearing the western part of Kuwait City. The 3rd Egyptian Mechanized Division screened north from its position at Al-Abraq.

I Marine Expeditionary Force

The final day of the ground offensive found I MEF in defensive position outside of Kuwait City. In the 2nd MARDIV sector, the 6th and 8th Marines had spent the previous night planning to attack into Al-Jahra to seize the key Kuwait military bases in the area and secure the northern road. Liaison had been established with the Kuwaiti resistance, now in control of most of the city, to ensure that Marines and resistance fighters would not fire on one another. However, when offensive operations ended, the Marines remained outside the city as planned. 1st MARDIV consolidated its positions. I MEF assisted the passage of Arab-Islamic forces into Kuwait City. The 3rd MAW, ordered to stand down, provided helicopter support, moving supplies and logistics to forward units, and flew CAP over the MEF sector. During the ground offensive, 3rd MAW had flown 9,569 sorties in support of Marine and Coalition forces, 8,910 of which were fixed-wing sorties in support of the advancing ground troops.

Joint Forces Command - East

JFC-E ceased offensive operations and consolidated south of the Seventh Ring Road in Kuwait City. TF Victory of the Saudi SF secured the Saudi Embassy. One battalion-size task force entered Kuwait City and remained near the Sixth Ring Road. Royal Saudi Marines occupied Mina As-Sa'ud. Other JFC-E forces continued to clear enemy in their area.

SUMMARY OF THE GROUND CAMPAIGN

When offensive operations ended, the Coalition faced the beaten remnants of a once-formidable foe. Coalition ground forces, with tremendous support from air and naval forces, had defeated the Iraqi Army. Coalition armies stood on the

banks of the Euphrates River, stretched across the Iraqi and Kuwaiti deserts and patrolled a liberated Kuwait City.

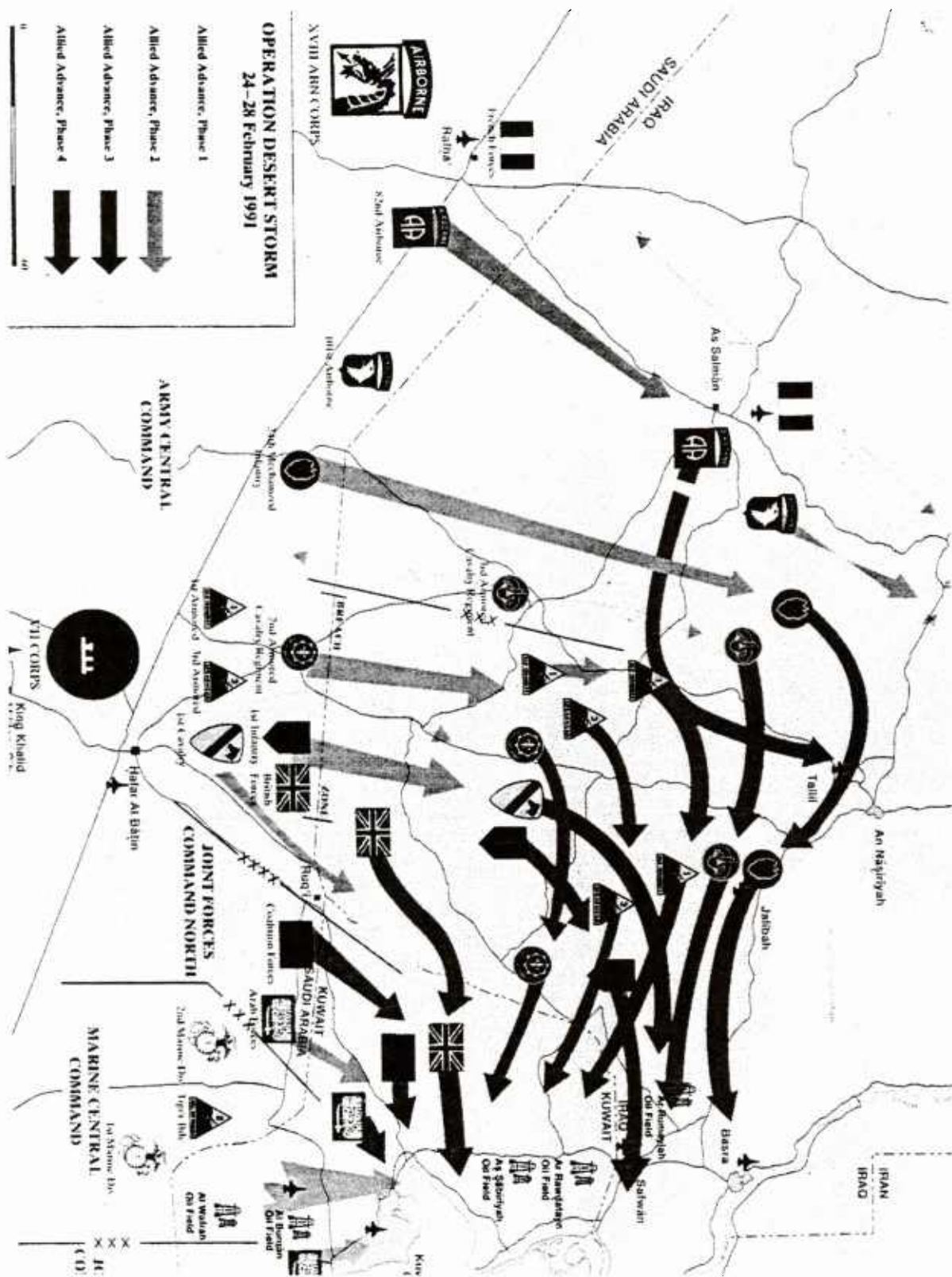
The ground campaign's results were impressive. The ground offensive lasted 100 hours and achieved all of CINCCENT's objectives. US and Coalition forces:

- Controlled critical Lines Of Communications in the KTO;
- Ejected Iraqi forces from Kuwait;
- Secured Kuwait International Airport and crossroads west of Kuwait City;
- Flanked, cut off, and destroyed Republican Guards Forces; and,
- Liberated Kuwait City.

When the ground offensive started, the rapid rate of advance coupled with the violence with which enemy forces were encountered and suppressed or destroyed precluded an accurate assessment and count of battle damaged or destroyed enemy equipment. Ground commanders remained focused on reaching their final objectives with the thought that an accurate battle damage assessment would be conducted after completion of combat operations.

After cessation of hostilities, most ground unit intelligence sections sent teams of soldiers to walk the battlefields and more accurately assess the number of enemy armored vehicles damaged, or captured. Information from these teams was sent to CENTCOM. The CENTCOM Joint Intelligence Center analyzed the numbers reported from the field and in many cases validated them with imagery or other sources of intelligence. Analysis and correlation of data was completed by 18 March 1991. The final numbers of enemy vehicles estimated by CENTCOM as destroyed or captured by Coalition forces during the entire Operation Desert Storm campaign were 3847 tanks, 1450 armored personnel carriers, and 2917 artillery pieces. It is important to note that these numbers are estimates only. (Chapter VI contains additional information on BDA evaluations.)

Final CENTCOM estimates were that only five to seven of their 43 combat divisions remained capable of offensive operations and an estimated 86,000 prisoners had been captured (64,000 by US forces). The combined Coalition forces – ground, air, naval, special, and supporting forces – had won one of the fastest and most complete victories in military history.



CONCLUSIONS

The ground campaign was clearly a success and the final, crucial element in a decisive Coalition victory. The Coalition forged an effective fighting force, destroyed much of the Iraqi army, and liberated Kuwait while sustaining light casualties. This overall victory was achieved through detailed planning and bold, aggressive execution. Coalition air forces rapidly achieved air superiority in the KTO and set the stage for the Coalition ground forces' dramatic envelopment, destruction of the combat effectiveness of the Republican Guards and defeat of Saddam Hussein's forces in detail. This is not to say Coalition forces executed flawlessly, or always operated strictly according to the dictates of established doctrine; but they showed great professionalism and often improvised brilliantly. Finally, the enemy's limitations and aspects of the weather and terrain each contributed at times to ultimate Coalition victory.

However, no examination of the ground campaign would be complete if it dealt solely with assembly of forces and support structure in the theater of operations and the execution of the battle plans. The foundation of Operation Desert Storm was laid in the immediate aftermath of Vietnam. Developments within the US military were set in the context of the US-Soviet conflict and focused on combat operations in central Europe against a massive, armor-heavy threat. Programs begun in the mid-1970s reorganized the armed services on a volunteer basis, began to revise doctrine based on maneuver warfare, revitalized the noncommissioned officer and officer education programs, and formulated a long-range modernization effort. These and other steps combined to create the most capable land force in US history. It was this force that defeated one of the largest armies in the world – with more than 43 committed divisions and 10,000 items of combat equipment.

One hundred hours of ground combat was too short a period to form comprehensive judgments about specific strengths or shortcomings. Much evidence remains anecdotal. In addition, the theater, the enemy and the global political situation were unique. Nonetheless, the Operation Desert Storm victory was unquestionably enabled by many years of thought, realistic planning, new doctrinal concepts, new unit designs and structures, an investment strategy for equipment modernization, and a training strategy for all components. The following observations reflect the essential elements of the land force's success.

Quality people are the single most important requirement for US forces. Without capable, motivated young men and women, technology alone will not be decisive. Good leadership and training are essential to readiness. Well-trained forces are confident in themselves, their leaders, and their equipment. The leaders of Operation Desert Storm were developed through a combination of practical experience and formal instruction. US combat units were led by seasoned professionals at every level – platoon sergeants with 10 years' troop duty; company commanders, developed through progressive assignments for six years to prepare them for command; and battalion commanders with 17 years' service behind them,

much of it in tactical assignments. Operation Desert Storm was rapid, successful, and cost relatively few American casualties because US forces maintained high levels of combat readiness in peacetime.

The systematic evolution of doctrine before Operation Desert Storm served the land forces well. Service doctrines that stressed maneuver warfare fundamentals, coupled with joint doctrine for air, land, and maritime operations under a unified commander were a significant advantage. Operation Desert Storm was a clear demonstration of the overwhelming effectiveness of joint and combined operations synchronized by sound doctrine and experienced leaders.

The proper balance of land forces – light, airborne, air assault, armored, special operations and amphibious, along with appropriate combat support (CS) and combat service support (CSS) Active and Reserve, gave the Coalition the range of capabilities necessary to defeat Saddam Hussein.

Modern weapons systems and technology, in the hands of well-trained and well-led forces, provide the critical edge in modern combat. US ground forces had equipment that enabled them to decisively defeat the Iraqi forces. Moreover, US forces were trained to maximize this equipment's effectiveness. Tough training, technological superiority, and continued modernization are crucial to ensuring the lethality of the smaller forces of the future.

The weather and terrain conditions, on balance, favored Coalition victory. As demanding as the climate was, Coalition forces were well-equipped and supported. Iraqi forces, often isolated in static defenses for long periods, were steadily demoralized by air and psychological operations along with the harsh conditions. Accordingly, many Iraqis lost the will to resist by the time the ground operation began. The combination of austere terrain and desert weather coupled with extended periods of reduced visibility let US forces exploit the advantages of long-range weapons and all-weather, day-night sight systems. In many instances, this provided the crucial edge for success and contributed to the low casualty rate.

Joint and combined exercises, security assistance, and military-to-military contacts produced valuable relationships and infrastructure within the region that contributed to the creation of a militarily effective Coalition. Many US military leaders were accustomed to operating with Arab and other Islamic forces, and thus were adept at modifying US operational practices to accommodate other nations' requirements. The US doctrine, strategy, and tactics, developed originally in response to the Soviet threat to Western Europe, stressed maneuver warfare based on continuous operations, flexibility, agility, initiative and synchronization, attributes that served Coalition commanders well as they planned and executed the ground operation against Saddam Hussein. Years of cooperation and combined operations within the North Atlantic Treaty Organization (NATO) smoothed integration of European allies into the operation. In the end, the Coalition executed an integrated campaign that combined the combat power of each Coalition partner. Although CINCCENT did not exercise total control over all Coalition forces, unity of effort was achieved through careful and systematic coordination.

A soldier from the 3rd Armored Division's A Troop, 4th Squadron, 7th Cavalry was asked if it was worth it. *"Gut level? Yeah it was worth it. And for all those people back home that supported us, who believed in us, we did it for them."*

(From a videotaped interview by the VII Corps Public Affairs Office)

OBSERVATIONS

Accomplishments

- An overwhelming, rapid, continuous, joint and multi-national ground offensive enveloped Iraqi forces, destroyed the combat effectiveness of Iraqi units in the KTO and liberated Kuwait.
- Service doctrine for land warfare worked. Army AirLand Battle and USMC maneuver warfare doctrine were compatible and set the example for Coalition ground operations.
- Deception played a crucial role in ground operations and was integrated in all phases of the plan. Coupled with strict OPSEC, it helped fix Iraqi forces until it was too late for them to react to Coalition ground attacks. Deception was especially important during ground operations due to the need for surprise, and the vulnerability of large numbers of massed combat and support troops just before G-Day.
- Despite the difficult terrain and weather, Coalition maneuver forces moved rapidly over great distances. In 100 hours of combat, XVIII Airborne Corps maneuvered its lead elements approximately 260 miles. Armor-heavy VII Corps maneuvered over 150 miles as it enveloped Iraqi forces. I MEF also demonstrated tremendous agility as it breached two minefields and obstacle belts, fought off several armored counterattacks, and destroyed or trapped numerous Iraqi divisions.
- US Soldiers, Marines, British and French forces, and the forces of JFC-N and JFC-E outfought their Iraqi foes. Courage, determination, training and leadership at all levels were decisive in hundreds of individual fire fights and contributed directly to Coalition victory.

Shortcomings

- Intelligence support to tactical commanders was sufficient, but suffered from a lack of available assets and difficulties in disseminating national and theater intelligence. Tactical intelligence dissemination was constrained by a lack of sophisticated and secure communications below division level.
- Logistics units were hard-pressed to keep up with the rapid pace of maneuver units. Both logistics structure and doctrine were found wanting in the high tempo offensive operation. HEI and off-road truck mobility were limited, and MSRs into Iraq few and constricted. Had the operation lasted longer, maneuver forces would have outrun their fuel and other support.

Issues

- The US had time to prepare its ground offensive while coalition-building, political and diplomatic efforts, and commercial sanctions ran their courses. The ability to rapidly move robust fighting forces will be a key challenge.
- The ground campaign was conducted by heavy, airborne, and air assault forces, all of which depend on large, bulky equipment for much of their combat power. Ways to improve strategic lift and tactical mobility continue to be a major priority.
- Measures to improve US chemical and biological defense readiness contributed to the ability of the Coalition to pursue the campaign in the face of a significant Iraqi chemical/biological warfare threat. The effectiveness of US chemical and biological defensive equipment and procedures was not challenged during the conflict.
- Breaching minefields under enemy fire proved demanding. Requirements for countermine and engineer equipment should be reviewed carefully.

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GLOSSARY

A

A-box - fire support box; subdivision of a kill box [USMC]

AAA - antiaircraft artillery

AADC - Area Air Defense Commander

AAR - after-action review

AAV - assault amphibian vehicle; fully tracked vehicle able to carry Marines and equipment from assault ship to inland objectives and during subsequent operations ashore [USMC]

AAW - anti-air warfare; action to destroy or reduce to an acceptable level the enemy air and missile threat [Navy; USMC]

ABCCC - Airborne Battlefield Command and Control Center; aircraft equipped with communications, data link, and display equipment; airborne command post or communications and intelligence relay facility

ABDR - Aircraft Battle Damage Repair [USAF]

ABFDS - Aerial Bulk Fuel Delivery System [USAF]

AC - Active Component

ACA - Airspace Control Authority

ACAA - automatic chemical agent alarm

ACC - 1) Arab Cooperation Council; 2) Airspace Coordination Center [CENTCOM]

ACINT - acoustic intelligence

ACE - 1) Airborne Command Element [USAF]; 2) armored combat excavator [Army]; 3) Air Combat Element [NATO]; 4) Aviation Combat Element; the task-organized Marine Air-Ground Task Force element that contains aviation and aviation support forces. It includes aviation command (including air control), combat, combat support, and combat service support units needed to accomplish a mission [USMC]

ACR - Armored Cavalry Regiment [Army]

ACV - 1) armored combat vehicle; 2) air cushion vehicle

ADA - air defense artillery

A/DACG - Arrival/Departure Airfield Control Group

ADOC - Air Defense Operations Center; an area and airspace above it within which established procedures minimize interference between air defense and other operations

ADR - Aircraft Damage Repair [Navy]

ADSS - ANVIS Display Symbology System

ADVCAP - advanced capability

AE - assault echelon; the element of a force scheduled for initial assault on the objective area

AEW - airborne early warning; detection of enemy air or surface units by radar or other equipment in an airborne vehicle and transmission of a warning to friendly units

AFB - Air Force Base

AF/SA - Headquarters USAF Studies and Analysis Agency

AF/XO - Headquarters USAF Plans and Operations

AFCS - Automatic Flight Control System; a system that includes all equipment to control automatically the flight of an aircraft or missile to a path or attitude described by internal or external references

AFID - anti-fratricide identification device

AFLC - Air Force Logistics Command

AFMSS - Air Force Mission Support System

AFOE - assault follow-on echelon; the additional forces, supplies and equipment needed for a landing force to continue operations ashore after an amphibious landing. Normally embarked aboard amphibious shipping or Military Sealift Command ships able to unload without port facilities [Navy; USMC]

AFR - Air Force Reserve

AFRC - Armed Forces Recreation Center

AFRRI - Armed Forces Radiobiology Research Institute

AFRTS - Armed Forces Radio and Television Service

AFSAC - Air Force Special Activities Center

AFSOC - Air Force Special Operations Command

AFSOCCENT - Air Force Special Operations Command, CENTCOM

GLOSSARY-2

AFSOUTH - Allied Forces, South [NATO]

AG - Adjutant General [Army]

AGMC - Aerospace Guidance and Meteorology Center [USAF]

AI - air interdiction; air operations to destroy, neutralize or delay the enemy's military potential before it can be brought to bear effectively against friendly forces, at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required

AIMD - Aircraft Intermediate Maintenance Detachment [Navy, USMC]

air superiority - that degree of dominance in the air battle of one force over another which permits operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force

air supremacy - that degree of air superiority wherein the opposing air force is incapable of effective interference

AIRBOC - air rapid-bloom off-board chaff countermeasures cartridge

AJCM - anti-jam control modem

ALC - Air Logistics Center [USAF]

ALCE - Airlift Control Element [USAF]

ALCM - air-launched cruise missile

ALFS - airborne low-frequency sonar

ALO - air liaison officer; an officer (aviator/pilot), attached to a ground unit, who functions as the primary advisor to the ground commander on air operations

AMC - Army Materiel Command

AMCM - aviation mine countermeasures [Navy]

AMRAAM - advanced medium-range air-to-air missile

AMTI - airborne moving-target indicator

ANG - Air National Guard

ANGLICO - Air-Naval Gunfire Liaison Company; a company with liaison and communications teams designed to coordinate naval gunfire and air support for ground forces [USMC]

ANZUS - Australia-New Zealand-United States Treaty

AO - area of operations

AOA - amphibious objective area; a geographic area, delineated in the initial directive, for command and control, within which is located the objective(s) to be secured by an amphibious task force

AOR - area of responsibility; a defined land area in which responsibility is specifically assigned to the area commander for development and maintenance of installations, movement control and tactical operations involving troops under his control, along with parallel authority to exercise these functions

APC - armored personnel carrier; a lightly armored, highly mobile, full-tracked vehicle, amphibious and air-droppable, used primarily for transporting personnel and their individual equipment during tactical operations

APF - Afloat Prepositioning Force

APOD - aerial port of debarkation

APOE - aerial port of embarkation

APS - afloat pre-positioned ship

APU - auxiliary power unit

ARC - 1) Air Reserve Components; 2) American Red Cross

ARCENT - Army Component, Central Command

ARG - Amphibious Ready Group

ARNG - Army National Guard

ARSOC - Army Special Operations Command

ARSOFTF - Army Special Operations Forces Task Force

ASARS - Advanced Synthetic Aperture Radar System [USAF]

ASBPO - Armed Services Blood Program Office

ASE - aircraft survivability equipment

ASL - 1) allowable supply list; 2) authorized stockage list [Army]

ASM - armed scout mission

ASMD - antiship missile defense

ASR - armed surface reconnaissance [Navy]

assault shipping - shipping assigned to an amphibious task force used to transport the assault echelon to the objective area [Navy]

ASUW - antisurface warfare

ASW - antisubmarine warfare

ATACMS - Army Tactical Missile System

ATAF - Allied Tactical Air Force [NATO]

ATAS - air-to-air Stinger

ATBM - antitactical ballistic missile

ATC - 1) Air Transportable Clinic [USAF]; 2) air traffic control

ATCC - Antiterrorism Coordinating Committee

ATF - Amphibious Task Force ; naval force and landing force, with supporting forces, organized and equipped for amphibious operations[Navy; USMC]

ATGM - anti-tank guided munition

ATH - Air Transportable Hospital [USAF]

ATHS - Airborne Target Handover System

ATO - air tasking order

AUTODIN - Automatic Digital Network

AUTOVON - Automatic Voice Network; formerly the principal long-haul, unsecure voice communications network within the Defense Communications System; replaced by Defense Switched Network

AVGAS - aviation gasoline

AVIM - Aviation Intermediate-level Maintenance

AVLB - armored vehicle-launched bridge

AVSCOM - Aviation Systems Command [Army]

AVUM - Aviation Unit-level Maintenance [Army]

AWACS - Airborne Warning and Control System; air surveillance and control provided by airborne early warning vehicles equipped with search and height-finding radar and communications equipment for controlling weapons

B

BAAF - Bahrain Amiri Air Force

BAI - battlefield air interdiction

BASE-LITE - base imagery transmission equipment

BCTP - Battalion Command Training Program

BDA - battle damage assessment

BEEF - Base Emergency Engineering Force [USAF]

BFV - Bradley fighting vehicle

BGTT - Battle Group Tactical Training Continuum [Navy]

Black Hole - CENTCOM air campaign planning staff offices

BLSSS - Base-Level Self-sufficiency Spares [USAF]

BLT - Battalion Landing Team; in an amphibious operation, an infantry battalion normally reinforced by necessary combat and service elements [USMC]

BMW - Bombardment Wing [USAF]

BUU - basic user unit [USMC]

BVR - beyond visual range

BW - biological warfare; use of biological agents to produce casualties in man or animal and damage to plants or materiel; or defense against such use; also biological weapon

C

C-Day - the unnamed day on which a deployment operation begins or is to begin (in the case of Operation Desert Shield, 7 August 1990)

CA - Civil Affairs; those phases of the activities of a commander which embrace the relationship between the military forces and civil authorities and people in a friendly or occupied country or area when military forces are present

CAB - Combat Aviation Brigade

CAF - Canadian Air Force

CAFMS - Computer-assisted Force Management System

CAG - Civil Affairs Group

CALS - Committee on Ammunition Logistics Support

CAM - chemical agent monitor

CANA - convalescent antidote for nerve agent

CAP - combat air patrol; an aircraft patrol provided over an objective area, over the force protected, over the crucial area of a combat zone, or over an air defense area, to intercept and destroy hostile aircraft before they reach their target

Capstone - Army program that aligns units, regardless of component, into a wartime command structure

CAS - close air support; air action against hostile targets near friendly forces, which require detailed integration of each air mission with the fire and movement of those forces

CATF - Commander, Amphibious Task Force [Navy]

CATM - captive airborne training missile

CAX - combined arms exercise [USMC]

CBPS - chemical biological protective shelter

CBS - Columbia Broadcasting System

CCJ5-SPG - Central Command J5-Special Planning Group

CDC - Combat Development Command [USMC]

CDE - chemical defense equipment

CDTF - Chemical Decontamination Training Facility

CEM - combined effects munition

CENTAF - Air Force Component, Central Command

CENTCOM - US Central Command

CEP - circular error probable; an indicator of the accuracy of a weapon system, used as a factor in determining probable damage to a target; the radius of a circle in which half of a missile's projectiles are expected to fall

CFV - cavalry fighting vehicle

CHAMPUS - Civilian Health and Medical Program for the Uniformed Services

Checkmate - Headquarters USAF Air Staff planning group

CI - 1) counterintelligence; activities concerned with identifying and counteracting the security threat posed by hostile intelligence services or organizations, or by individuals engaged in espionage, sabotage, subversion or terrorism; 2) civilian internee; a civilian interned during armed conflict or occupation for security reasons or for protection or because he has committed an offense against the detaining power

CIA - Central Intelligence Agency

CIC - 1) Combat Information Center [Navy]; 2) Combined Intelligence Center [CENTCOM]

CILMC - Contingency Intermediate-level Maintenance Center

CINC - Commander-in-Chief

CINCCENT - Commander-in-Chief, Central Command

CINCEUR - Commander-in-Chief, European Command

CINCFOR - Commander-in-Chief, Forces Command

CINCLANT - Commander-in-Chief, Atlantic Command

CINCPAC - Commander-in-Chief, Pacific Command

CINCSPACE - Commander-in-Chief, Space Command

CINCSAC - Commander-in-Chief, Strategic Air Command

CINCSO - Commander-in-Chief, Southern Command

CINCSOC - Commander-in-Chief, Special Operations Command

CINCTRANS - Commander-in-Chief, Transportation Command

CITV - commanders' independent thermal viewer

CJCS - Chairman, Joint Chiefs of Staff

CLF - 1) Combat Logistics Force; 2) Commander, Landing Force [Navy, USMC]

CLSF - Combined Logistics Stores Facility

CLSS - Combat Logistics Support System

CLSU - Communications Security Logistics Support Unit

GLOSSARY-8

CMEF - Commander, Middle East Force

CMTC - Combat Maneuver Training Center

CNN - Cable News Network

CNO - Chief of Naval Operations; the Navy's senior uniformed leader

COCOM - combatant command (command authority)

COE - Corps of Engineers [Army]

COMCARGRU - Commander, Carrier Group

COMCRUDESGRU - Commander, Cruiser Destroyer Group

COMDESRON - Commander, Destroyer Squadron

COMINT - communications intelligence; technical and intelligence information derived from foreign communications by other than the intended recipients

COMSAT - communications satellite

COMSEC - communications security; protection against unauthorized receipt of telecommunications

COMTAC - Commander, Tactical Air Command

CONOPS - 1) concept of operations; 2) contingency operations

CONUS - Continental United States

COP - Concept Outline Plan

COSCOM - Corps Support Command

CP - command post; a unit or subunit headquarters where the commander and staff perform their activities

CPX - command post exercise

CRAF - Civil Reserve Air Fleet

CRC - CONUS Replacement Center

cross level - shifting of people and/or equipment from one unit to another to make the receiving unit ready for deployment

CS - combat support

CSAR - combat search and rescue

CSG - Cryptologic Support Group [NSA]

CSH - Combat Support Hospital

CSOA - combined special operations area

CSS - combat service support; assistance provided operating forces primarily in administrative services, chaplain services, civil affairs, finance, legal services, health services, military police, supply, maintenance, transportation, construction, troop construction, acquisition and disposal of real property, facilities engineering, topographic and geodetic engineering functions, food service, graves registration, laundry, dry cleaning, bath, property disposal and other logistics services

CSSA - 1) CENTAF Supply Support Activity [USAF]; 2) combat service support area; area from which logistics support is provided to forward units and where logistics operations are conducted. [USMC]

CSSD - Combat Service Support Detachment; task-organized service support unit assigned to support directly specific forward units, sites, or airfields [USMC]

CSSE - Combat Service Support Element; those elements whose primary missions are to provide service support to combat forces and which are a part, or prepared to become a part of a theater, command or task force formed for combat operations

CT - counterterrorism; offensive measures to prevent, deter and respond to terrorism

CTC - Combat Training Center [Army]

CTT - Coordination and Training Team [SOF]

CUCV - commercial utility cargo vehicle

CVBG - Aircraft Carrier Battle Group

CW - chemical warfare; all aspects of military operations involving the use of lethal and incapacitating munitions/agents and the warning and protective measures associated with such offensive operations; also chemical weapon

CWC - Composite Warfare Commander [Navy]

CY - calendar year

C2 - command and control

C3 - command, control, and communications

C3I - command, control, communications, and intelligence

C3IC - Coalition, Coordination, Communication, and Integration Center

C4 - command, control, communications, and computers

D

D-Day - the unnamed day on which a particular operation begins or will begin; (in the case of Operation Desert Storm, 17 January 1991)

DA - direct action [SOF]

DAMA - demand assigned multiple access; multiplexing system which permits one satellite channel to be shared by multiple users simultaneously

DARPA - Defense Advanced Research Projects Agency

DARS - daily aerial reconnaissance and surveillance [CENTCOM]

DAS - direct air support

DASC - Direct Air Support Center; a subordinate operational component of a tactical air control system designed for control and direction of close air support and other tactical air support operations, normally collocated with fire support coordination elements

DASC-A - Direct Air Support Center - Airborne; an airborne aircraft equipped with the necessary staff, communications and operations facilities to function as a direct air support center

DCA - 1) Defense Communications Agency; 2) Defense Cooperation Account; 3) defensive counter-air

DCI - Director of Central Intelligence

DCP - director of air campaign plans [CENTCOM]

DCS - 1) Defense Communications System; 2) Digital Computer System

DDI - Deputy Director for Intelligence [CIA]

DDN - Defense Data Network

DDO - Directorate of Operations [CIA]

DDS - 1) Defense Dissemination System; 2) dry deck shelter [Navy]

DEFSMAC - Defense Special Missile and Astronautics Center

DESCOM - Depot System Command [Army]

DEPMEDS - Deployable Medical Systems

DF - direction finding; a procedure for obtaining bearings of radio frequency emitters by using a highly directional antenna and a display unit on an intercept receiver or ancillary equipment

DFR/E - Defense Fuel Region/Europe

DFR/ME - Defense Fuel Region/Middle East

DFSC - Defense Fuel Supply Center

DFSP - Defense Fuel Support Point

DIA - Defense Intelligence Agency

DIAC - Defense Intelligence Analysis Center

DIPEC - Defense Industrial Plant Equipment Center

DISA - Defense Information Systems Agency

DISCOM - Division Support Command

DLA - Defense Logistics Agency

DLR - depot-level repairable

DMA - Defense Mapping Agency

DMI - Directorate of Military Intelligence [Iraq; Israel; Egypt]

DMPI - designated mean point of impact

DMRIS - Defense Medical Regulating Information System

DMSP - Defense Meteorological Satellite Program

DNA - Defense Nuclear Agency

DNBI - disease, non-battle injury

DOD - Department of Defense

DOD-JIC - DOD Joint Intelligence Center

DODEX - DOD Intelligence Information System Extension

DOS - day of supply; a unit or quantity of supplies adopted as a standard of measurement, used in estimating the average daily expenditure under stated conditions

DPG - Defense Planning Guidance
DPSC - Defense Personnel Support Center
DSA - defense special assessment [DIA]
DSCS - Defense Satellite Communications System
DSCSOC - Defense Satellite Communications System Operations Center
DSMAC - digital scene-matching area correlation
DSN - Defense Switched Network
DSNET - Defense Secure Network
DSP - Defense Support Program
DTED - digital terrain elevation data
DVITS - Digital Video Imagery Transmission System

E

E&E - evasion and escape; procedures to emerge from a hostile area
EAC - 1) echelons above corps; 2) Eastern Area Command
EBC - echelons below corps
EC - European Community
ECCM - electronic counter-countermeasures; that division of electronic warfare involving actions to ensure friendly use of the electromagnetic spectrum despite the enemy's use of electronic warfare
ECM - electronic countermeasures; that division of electronic warfare involving actions to prevent or reduce an enemy's effective use of the electromagnetic spectrum
EFVS - Electronic Fighting Vehicle System
EHF - extremely high frequency
ELANT - East Atlantic Satellite

ELINT - electronics intelligence; information derived from foreign non-communications electromagnetic radiations emanating from other than nuclear detonations or radioactive sources

ELT - English language training

ELV - expendable launch vehicle

EMIS - electromagnetic isotope separation

EMP - electromagnetic pulse; the electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium

ENWGS - Enhanced Naval Warfare Gaming System

EOB - electronic order of battle

EOD - explosive ordnance disposal; the detection, identification, field evaluation, rendering-safe, recovery and final disposal of unexploded ordnance

EOSAT - Earth Observable Satellite Corp.

EPDS - Electronic Processing and Dissemination System

EPW - enemy prisoner of war

ESM - 1) electronic surveillance methods; 2) electronic warfare support measures

EUCOM - US European Command

EUCOMM-Z - US European Command Communications Zone

EVAC - evacuation hospital

EW - electronic warfare; military action involving the use of electromagnetic energy to determine, exploit, reduce or prevent hostile use of the electromagnetic spectrum through damage, destruction, and disruption while retaining friendly use of the electromagnetic spectrum

F

FA - field artillery

FAC - forward air controller; an officer (aviator/pilot) member of the tactical air control party who, from a forward ground or airborne position, controls aircraft in close air support of ground troops

F AE - fuel air explosive

F AF - French Air Force

FAISS-E - FORSCOM Automated Intelligence Support System - Enhanced [Army]

FAMMO - full ammo [Navy]

FARP - forward arming and refueling point; a temporary facility, organized, equipped, and deployed by an aviation commander, and normally located in the main battle area closer to the area of operation than to the aviation unit's combat service area, to provide fuel and ammunition necessary for use by the aviation maneuver units in combat

FAST - 1) forward area ID and TRAP broadcast; 2) Fleet Antiterrorist Security Team [USMC]

FASTCAL - Field Assistance Support Team for Calibration

FBI - Federal Bureau of Investigation

FCTC - Fleet Combat Training Center [Navy]

FDA - Food and Drug Administration

FDL - Fast Deployment Logistics

FDR/FA - flight data recorder/fault analyzer

FEBA - forward edge of the battle area; the foremost limits of a series of areas in which ground combat units are deployed, excluding the areas where the covering or screening forces are operating, designated to coordinate fire support, and the positioning or maneuver of units

FEWS - Follow-on Early Warning System

FFC-A - Forward Forces Command - 'Ar'ar

FHE - Forward Headquarters Element

FID - Foreign Internal Defense; participation by civilian and military agencies of a government in any action taken by another government to free and protect its society from subversion, lawlessness, and insurgency

FIE - fly-in echelon; Marines, supplies and equipment deployed by strategic airlift during an operation [USMC]

FIST - Fleet imagery support terminal

FLIR - forward-looking infrared

FLOT - forward line of own troops; indicates the most forward positions of friendly forces in any kind of military operation at a specific time

FLTCORGRU - Fleet Coordinating Group

FLTSAT - Fleet Satellite

FLTSATCOM - Fleet Satellite Communications

FMF - Fleet Marine Force

FMO - Frequency Management Office

FMS - Foreign Military Sales; that part of US security assistance authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended; the recipient reimburses for defense articles and services transferred

FMTV - family of medium tactical vehicles

FOB - forward operating base

FOL - forward operating location

FORSCOM - Forces Command

FROG - free rocket over ground

FSA - fire support area; a maneuver area assigned to fire support ships from which to deliver gunfire support of an amphibious operation

FSCL - Fire support coordination line; a line established by the ground commander to ensure coordination of fire not under his control, but which may affect current tactical operations

FSS - fast sealift ship

FSSG - Force Service Support Group; combat service support element of a Marine Expeditionary Force [USMC]

FTD - Foreign Technology Division [USAF]

FY - fiscal year

G

G-Day - the first day of the ground campaign (in the case of Operation Desert Storm, 24 February 1991)

GA - Tabun, a nerve agent

GB - Sarin, a nerve agent

GC - Geneva Convention Relative to the Protection of Civilian Persons in Time of War

GCC - Gulf Cooperation Council

GCE - ground combat element; ground maneuver element of a Marine Air-Ground Task Force; task organized around an infantry or armor unit with combat, combat support, and combat service support attachments [USMC].

GCI - ground controlled interception; a technique that permits control of friendly aircraft or guided missiles to effect interception

GD - Soman, a nerve agent

GF - a nerve agent

GHQ - General Headquarters

GMF - Ground Mobile Force

GNA - Goldwater-Nichols Department of Defense Reorganization Act of 1986

GPS - Global Positioning System

GPW - Geneva Convention Relative to the Treatment of Prisoners of War

GRCA - ground reference coverage area

GSM - ground station module

GWS - Geneva Convention Relative to the Treatment of Wounded or Sick Prisoners of War

H

H-Hour - the specific time at which an operation or exercise begins or is scheduled to begin; (in the case of Operation Desert Storm, 0300 local time, 17 January 1991); initial time of arrival of first aircraft over target

HARM - high-speed anti-radiation missile

HEMTT - heavy expanded mobility tactical truck

HET - heavy equipment transporter

HF - high frequency

HFDF - high frequency direction finding

HIDACZ - High Density Airspace Control Zone; doctrinal innovation used during Gulf crisis to delineate airspace under the control of I Marine Expeditionary Force; it enabled I MEF to control airspace over and forward of its units in response to the changing tactical situation

HIRSS - Hover Infrared Suppressor Subsystem

HLPS - heavy-lift preposition ship

HMMWV - high-mobility multi-purpose wheeled vehicle

HNS - host nation support; civil and military assistance given in peace and war by a host nation to allied forces on or in transit through the host nation's territory

HQDA - Headquarters, Department of the Army

HSB - high speed boat

HSC - Health Services Command

HSEP - Hospital Surgical Expansion Package [USAF]

HSS - health service support

HU - Hospital Unit; a team split from a Field Hospital

HUD - heads-up display; a display of flight, navigation, attack or other information superimposed on a pilot's forward field of view

HUMINT - human resources intelligence; intelligence derived from human beings as both sources and collectors, where the human being is the primary collection instrument

HVAA - high-value airborne assets

I

I&W - indications and warning; those intelligence activities intended to detect and report time-sensitive intelligence information on foreign developments that could involve a threat to the United States or allied military, political, or economic interests or to US citizens abroad

IADS - Integrated Air Defense System [Iraq]

IAF - Italian Air Force

IATACS - Improved Army Tactical Communications System

IBAHRS - Inflatable Body and Head Restraint System

ICBM - intercontinental ballistic missile; a ballistic missile with a range from about 3,000 to 8,000 nautical miles

ICMMP - Integrated CONUS Medical Mobilization Plan

ICON - imagery communications and operations Node

ICRC - International Committee of the Red Cross/Crescent

IDF - Israel Defense Force

IES - Imagery Exploitation System

IFF - identification, friend or foe; a system using electromagnetic transmissions to which equipment carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces

IGSM - interim ground station module [JSTARS]

IHADSS - Integrated Helmet and Display Sight System [Army]

IIR - 1) imaging infrared; 2) Intelligence Information Report

IIS - Iraqi Intelligence Service

IMA - individual mobilization augmentee; a Reservist not assigned to a troop program unit, but with a specific mobilization mission and assignment, normally at a major headquarters

IMET - international military education and training; formal or informal instruction provided to foreign military students, units, and forces on a non-reimbursable basis by offices or employees of the United States, contract technicians and contractors

IMINT - imagery intelligence; intelligence derived from visual photography, infrared sensors, lasers, electro-optics and radar sensors such as synthetic aperture radar

INMARSAT - International Maritime Satellite

INS - Inertial Navigation System; a self-contained navigation system using inertial detectors, which automatically provides vehicle position, heading and velocity

IO - Indian Ocean satellite

IOC - 1) Intercept Operations Center [Iraq]; 2) initial operational capability; the first capability to use effectively a weapon, item of equipment, or system by a military unit

IPDS - Imagery Processing and Dissemination System

IPSA - Iraqi Pipeline Saudi Arabia

IR - infrared

IRDS - infrared detection set

IRR - Individual Ready Reserve; members of the Ready Reserve not assigned to the Selected Reserve and not on active duty

ISA - Intermediate Supply Activity [USMC]

ISAR - inverse synthetic aperture radar [Navy]

ISE - Intelligence Support Element

ITAC - Intelligence and Threat Analysis Center [Army]

ITALD - improved tactical air-launched decoy

ITF - Intelligence Task Force [DIA]

J

J-1 - director of personnel

J-2 - director of Intelligence

J-3 - director of operations

J-4/7 - director of logistics and security assistance

J-5 - director of plans and policy

J-6 - director of command and control, communications and computer systems

JAAT - Joint Air Attack Team

JAG - Judge Advocate General

JAIC - Joint Air Intelligence Center

JBPO - Joint Blood Program Office

JCEOI - joint communications electronics operations instructions

JCS - Joint Chiefs of Staff

JCSE - Joint Communications Support Element

JFACC - Joint Force Air Component Commander; assigned by joint force commander; duties normally include planning, coordination, allocation and tasking based on the joint force commander's apportionment decision; recommends apportionment of air sorties to various missions or geographic areas

JFC - Joint Forces Command

JFC-E - Joint Forces Command-East

JFC-N - Joint Forces Command-North

JFLC - Joint Forces Land Component

JFLCC - Joint Forces Land Component Commander

JIC - Joint Intelligence Center

JIF - Joint Interrogation Facility

JILE - Joint Intelligence Liaison Element; provided by the Central Intelligence Agency to support a unified command or joint task force

JIPC - Joint Imagery Production Complex

JITC - Joint Interoperability Test Center

JMRO - Joint Medical Regulating Office

JOC - Joint Operations Center; a jointly manned facility of a joint force commander's headquarters established for planning, monitoring, and guiding execution of the commander's decisions

JOPES - Joint Operation Planning and Execution System

JOTS - Joint Operational Tactical System [Navy]

JPO - Joint Petroleum Office

JPTS - jet petroleum, thermally stable

JRC - Joint Reconnaissance Center

JRCC - Joint Rescue Coordination Center; an installation staffed by supervisory personnel from all participating services, with facilities to direct and coordinate all available search and rescue facilities within a specified area

JROC - Joint Requirements Oversight Council

JRTC - Joint Readiness Training Center

JS - Joint Staff

JSCAT - Joint Staff Crisis Action Team

JSCC - Joint Services Coordination Committee

JSCP - Joint Strategic Capabilities Plan

JSOTF - Joint Special Operations Task Force

JSPS - Joint Strategic Planning System

JSTARS - Joint Surveillance Target Attack Radar System

JTC3A - Joint Tactical Command, Control and Communications Agency

JTF - Joint Task Force; a force composed of assigned or attached elements of the Army, Navy, Marine Corps, and the Air Force, or two or more services, which is constituted and so designated by the Secretary of Defense or by the commander of a unified command, a specified command, or an existing joint task force

JTFME - Joint Task Force Middle East

JTIDS - Joint Tactical Information Distribution System

K

KAF - Kuwaiti Air Force

kill box - geographic area designated for air strikes

KKMC - King Khalid Military City

KTF - Kuwait Civil Affairs Task Force

KTO - Kuwait Theater of Operations

L

LABCOM - Laboratory Command [Army]

LAI - light armored infantry; a mechanized infantry unit mounted in light armored vehicles with the mission of reconnaissance, screening, and conducting raids [USMC]

LAMPS - Light Airborne Multipurpose System [Navy]

LAN - local area network

landing force - a task organization of troop units, aviation and ground, assigned to an amphibious assault; highest troop echelon in the amphibious operation

LANTCOM - Atlantic Command

LANTIRN - low-altitude navigation and targeting infrared for night

LAR - logistics assistance representative

LAV - light armored vehicle ; eight-wheeled lightly armored family of vehicles used by Marine Light Armored Infantry battalions.[USMC]

LCAC - landing craft, air cushion; capable of carrying 60 tons from ship to shore at overwater speeds of more than 40 knots and ranges exceeding 50 miles

LCC - Land Component Commander

LCU - landing craft, utility

LEDET - Law Enforcement Detachment [Coast Guard]

LET - light equipment transporter

LGB - laser-guided bomb (see LGW)

LGW - laser guided weapon; a weapon which uses a seeker to detect laser energy reflected from a target and through signal processing guides itself to the point from which the laser energy is being reflected

LHA - amphibious assault ship, general purpose

LHT - line-haul tractor

littoral - the shore area between low and high tides

LNO - liaison officer

LOC - line of communication; land, water or air route which connects an operating military force with a base of operations and along which supplies and military forces move

LOROP - long range oblique photography

LOTS - logistics over the shore; the loading or unloading of ships without the benefit of fixed port facilities, in friendly or non-defended territory and, in time of war, during phases of theater development in which there is no enemy opposition

LPV - laser-protective visor

LRC - Logistics Readiness Center [USAF]

LRI - long-range international

LRU - line-replaceable unit [USAF]

LVS - Logistics Vehicle System; heavy transporter truck system capable of cross country movement [USMC]

M

M-box - maneuver box; subdivision of a kill box [USMC]

MAC - Military Airlift Command

MACCS - Marine Air Command and Control System; tactical air command and control system which gives the tactical air commander with the means to command, control, and coordinate all air operations within an assigned sector and to coordinate air operations with other services; it includes command and control agencies with communications-electronic equipment that incorporates a capability from manual through semiautomatic control. [USMC]

MACG - Marine Air Control Group; command within the Marine Aircraft Wing that contains the units and systems necessary to provide task-organized air command and control detachments to a Marine Air-Ground Task Force [USMC]

MACSAT - multiple access commercial satellite

MAG - Marine Aircraft Group; task organized aviation unit roughly equivalent in size to an Air Force wing. A composite MAG normally is the Aviation Combat Element for a Marine Expeditionary Brigade [USMC]

MAGTF - Marine Air-Ground Task Force; task organization of Marine air, ground, and combat service support forces under a single command and structured to accomplish a specific mission [USMC]

MAP - master attack plan

MARCENT - Marine Forces, Central Command; Marine component command ; it coordinated all administrative, logistical, and interservice issues for Marine forces ashore in Southwest Asia.

MARDIV - Marine Division

MARS - Military Affiliate Radio Station

MASH - Mobile Army Surgical Hospital

MASS - MICAP (mission critical parts) Asset Sourcing System

Maverick - air-to-surface missile with launch and leave capability; stand-off, outside point defense weapon able to strike point targets

MAW - Marine Aircraft Wing

MC - mission capable

MCAGCC - Marine Corps Air-Ground Combat Center, 29 Palms, CA

MCIC - Marine Corps Intelligence Center

MCLB - Marine Corps Logistics Base

MCM - mine countermeasures; all methods for preventing or reducing damage or danger from mines

MCSF - Mobile Cryptologic Support Facility

MCSSD - Mobile Combat Service Support Detachment [USMC]

MEA - munitions effectiveness assessment

MEB - Marine Expeditionary Brigade; Marine Air-Ground Task Force normally built around a command element, a regimental landing team, a composite aircraft group, and a service support group [USMC]

MEDEVAC - medical evacuation

MEDSOM - Medical Supply Optical and Maintenance [Army]

MEF - 1) Middle East Force; 2) Marine Expeditionary Force; Marine Air-Ground Task Force normally consisting of a command element, one or more Marine divisions, one or more aircraft wings, and a force service support group [USMC]

MEL - mobile erector launcher [Iraq]

MEPES - Medical Planning and Execution System

MET - medium equipment transporter

METL - mission-essential task list

METSAT - meteorological satellite

METT-T - mission, enemy, terrain, troops and time available

MEU - Marine Expeditionary Unit

MEU (SOC) - Marine Expeditionary Unit (Special Operations Capable); forward deployed amphibious Marine Air-Ground Task Force composed of a command element, a battalion landing team, a composite helicopter/AV-8B squadron, and service support element; capable of limited combat operations, especially rapidly planned amphibious raids and maritime special operations [USMC]

MEWSS - Mobile Electronic Warfare Support System; light armored vehicle specially equipped with electronic warfare equipment used to conduct tactical electronic warfare and signals intelligence operations [USMC]

MEZ - Missile Engagement Zone; in air defense, airspace of defined dimensions within which the responsibility for engagement normally rests with a particular weapon system

MHE - materiel-handling equipment

MI - Military Intelligence; intelligence on any foreign military or military-related situation or activity which is significant to military policy making or the planning and conduct of military operations and activities

MIB - Military Intelligence Board

MICAP - mission critical parts [USAF]

MIF - Maritime Interception Force

MILSATCOM - military satellite communications

MIMI - Ministry of Industry and Military Industrialization [Iraq]

MIPE - Mobile Intelligence Processing Element

MIO - Maritime Interception Operations

MITT - mobile integrated tactical terminal

MLRS - Multiple Launch Rocket System

MMS - mast-mounted sight [Army]

MNS - 1) Mine Neutralization System [Navy]; 2) mission need statement

MOC - Mobile Operations Center [USAF]

MOD - Minister (Ministry) of Defense

MODA - Minister (Ministry) of Defense and Aviation [Saudi Arabia]

MOPP - mission-oriented protective posture

MORE-CT - meals, ordered ready-to-eat, contingency test

MP - Military Police

MPA - maritime patrol aircraft

MPES - Medical Planning and Execution System

MPF - Maritime Prepositioning Force; combination of a Maritime Prepositioning Squadron and its associated Marine Expeditionary Brigade [USMC]

MPLH - multipurpose light helicopter

MPM - medical planning module

MPS - Maritime Prepositioning Squadron - squadron of four or five specially configured and loaded Military Sealift Command ships on which are carried the equipment and 30 days of supplies for a Marine Expeditionary Brigade [Navy, USMC]

MRE - meal, ready-to-eat

MRS - Mobility Requirements Study

MRSA - Materiel Readiness Support Agency

MSC - Military Sealift Command

MSE - mobile subscriber equipment

MSI - multi-spectral imagery

MSR - main supply route; the route or routes designated within an area of operations upon which the bulk of traffic flows in support of military operations

MTBF - mean time between failures

MTF - medical treatment facility

MTI - moving-target indicator; a radar presentation which shows only targets in motion

MTMC - Military Traffic Management Command

MTO - mission type order; order issued to a lower unit that includes the accomplishment of the total mission assigned to the higher headquarters, or to a unit to perform a mission without specifying how it is to be accomplished

MTT - Mobile Training Team; one or more US personnel drawn from Service resources and sent on temporary duty to a foreign nation to give instruction

MULE - modular universal laser equipment

MUST - Medical Unit, Self-contained, Transportable

MWR - Morale, Welfare and Recreation

N

NAC - Northern Area Command

NADEP - Naval Aircraft Depot

NAEW - NATO airborne early warning

NAF - Naval Air Facility

NAS - Naval Air Station

NATO - North Atlantic Treaty Organization

NAVCENT - Naval Component, Central Command

NAVEUR - Naval Forces, Europe

NAVOCFORMED - Naval On-call Force, Mediterranean

NAVSPACECOM - Naval Space Command

NAVSPECWARGRU - Navy Special Warfare Group

NBC - Nuclear/biological/chemical

NCA - National Command Authorities; the President and Secretary of Defense or their duly deputized alternates or successors

NCP - Non-US Coalition Partner

NCS - National Communications System

NCTR - Non-cooperative target resolution

NDI - non-developmental item

NDMS - National Disaster Medical System

NEO - Non-combatant evacuation operations

NETT - New Equipment Training Team [USA]

NGFS - Naval gunfire support

NIC - National Intelligence Council

NITF - national imagery transmission format

NLSF - Navy Logistics Support Force

NMIC - National Military Intelligence Center [DIA]

NMIST - National Military Intelligence Support Team [DIA]

NOAA - National Oceanographic and Atmospheric Administration

NOIC - Naval Operational Intelligence Center

NORAD - North American Aerospace Defense Command

NPIC - National Photographic Interpretation Center

NPWIC - National Prisoner of War Information Center

NRT - near-real time; delay caused by automated processing and display between the occurrence of an event and reception of the data at some other locations

NSA - National Security Agency

NSC - National Security Council

NSOC - 1) National Signals Intelligence Operations Center [NSA]; 2) Navy Satellite Operations Center

NSW - Naval Special Warfare

NSWC - Navy Surface Warfare Center

NSWTG - Naval Special Warfare Task Group

NSWTG-CENT - Naval Special Warfare Task Group, Central Command

NTC - National Training Center, Fort Irwin, CA

NTIC - Navy Tactical Intelligence Center

NTPF - Near-term Prepositioning Force

NTPS - Near-term Prepositioned Ships

NTU - new threat upgrade [Navy]

NVG - night-vision goggles

O

O&M - operations and maintenance

OASD, SO/LIC - Office of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict

OCA - offensive counterair; actions to destroy, disrupt or limit enemy air power as close to its source as possible

OCAC - Operations, Control and Analysis Center

OFP - Operational Flight Program

OICC - Operational Intelligence Crisis Center [DIA]

OIP - Optical Improvement Program

OMB - Office of Management and Budget

OPCOM - operational command; authority granted to a commander to assign missions or tasks to subordinate commander, to deploy units, reassign forces and to

retain or delegate operational and/or tactical control as deemed necessary; does not necessarily include administration or logistics [NATO]

OPCON - operational control; authority delegated to a commander to direct forces assigned so the commander can accomplish specific missions or tasks, usually limited by function, time or location; to deploy units concerned, and to retain or assign tactical control of those units; does not necessarily include administration or logistics

OPLAN - Operation Plan; a plan for a single or series of connected operations to be carried out simultaneously or in succession

OPORD - Operation Order; a directive, usually formal, issued by a commander to subordinate commanders to effect the coordinated execution of an operation

OPSEC - operations security; the process of denying adversaries information about friendly capabilities and intentions by identifying, controlling and protecting indicators associated with military operations

OPTEMPO - operating tempo; the pace of operations, such as the number of sorties flown, miles steamed, etc., in a given period

OP3 - Overt Peacetime Psychological Operations Program

OR - operational readiness

OSD - Office of the Secretary of Defense

OTH - over the horizon

OUTS - Operational Unit Transportable System

Over-the-horizon assault - amphibious assault conducted from ships located beyond visual and coastal surveillance radar ranges of shore defenders, normally 30 to 60 miles [USMC]

P

PACOM - Pacific Command

PASSEX - passing exercises

PBW - Bombardment Wing (Provisional)

PC-LITE - processor, laptop-imagery transmission equipment

PD - Probability of detection; the probability that the search object will be detected under given conditions if it is in the area searched

PGM - Precision-guided munition

PLGR - precise lightweight Global Positioning System receiver

PLO - Palestine Liberation Organization

PLRS - Position Location Reporting System

PLS - Palletized Load System

PNVS - Pilot Night-vision System

POG - Psychological Operations Group

POL - petroleum, oil and lubricants; a broad term which includes all petroleum and associated products used by the armed forces

POMCUS - prepositioned overseas materiel configured to unit sets

PORTS - Portable Remote Telecommunications System

POW - prisoner of war; a detained person as defined in Articles 4 and 5 of the Geneva Convention Relative to the Treatment of Prisoners of War of August 12, 1949; in particular, one who, while engaged in combat under orders of his government, is captured by the armed forces of the enemy

PREPO - Prepositioned force, equipment, or supplies

PRM - Presidential Review Memorandum

PSHD - Port Security Harbor Defense

PSV - pseudo-synthetic video

PSYOP - psychological operations; planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and ultimately, the behavior of foreign governments, organizations, groups and individuals

PWIC - Prisoner of War Information Center

PWIS2 - Prisoner of War Information System

Q

QEAF - Qatari Emiri Air Force

R

R&D - research and development

R&M - reliability and maintainability [USAF]

R&R - rest and recuperation; withdrawal of individuals from combat or duty in a combat area for short periods

RAF - Royal Air Force [UK]

RC - Reserve Component

RCCM - regional contingency construction management

RCHB - Reserve Cargo-handling Battalion [Navy]

RDF - Rapid Deployment Force

RDF - radio direction finding; radio locations in which only the direction of a station is determined by means of its emissions

RDJTF - Rapid Deployment Joint Task Force

RECCE - reconnaissance; action undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy; or to secure data concerning the meteorological, hydrographic or geographic characteristics of a particular area

RED HORSE - Rapid Engineer Deployable, Heavy Operational Repair Squadron, Engineer [USAF]

REDCOM - Readiness Command (1971)

REFORGER - Return of Forces to Germany

Regiment - Marine infantry unit equivalent in size to an Army brigade. A regiment fights as a task-organized force with other combat arms units attached; reinforced regiment normally numbers more than 4,000 Marines [USMC]

RFI - request for information

RGFC - Republican Guard Forces Command [Iraq]

RHIB - rigid-hull inflatable boat

RIB - rubberized inflatable boat

RIBS - Readiness in Base Services [USAF]

RIT - remote imagery transceiver

R/L - receive location

RLG - ring laser gyro

RLT - Regimental Landing Team; task organization for landing, composed of an infantry regiment reinforced by those elements required for beginning its combat mission ashore [USMC]

ROE - rules of engagement; directives issued by competent military authority which delineate the circumstances and limitations under which US forces will initiate and/or continue combat engagement with other forces encountered

ROEX - rules of engagement exercise

RO/RO - roll-on/roll-off ship ; a Military Sealift Command ship built so vehicles and equipment can be loaded by driving them up stern or bow ramps into the holds; a RO/RO greatly simplifies rapid deployment of ground forces and enables ships to be unloaded without extensive port facilities [Navy].

ROWPU - reverse osmosis water purification unit

RPV - remotely piloted vehicle; an unmanned vehicle able to be controlled from a distant location through a communications link; normally designed to be recoverable

RRF - Ready Reserve Fleet

RRFWG - Ready Reserve Force Working Group

RSADF - Royal Saudi Air Defense Force

RSAF - Royal Saudi Air Force

RSCG - Royal Saudi Coast Guard

RSLF - Royal Saudi Land Force

RSNF - Royal Saudi Naval Force

RSSC - Regional Signals Intelligence Support Center [NSA]

RSTA - reconnaissance, surveillance and target acquisition

RTSV - real-time synthetic video

RWR - radar warning receiver

S

SA - selective availability [GPS]

SAAF - Saudi Arabian Armed Forces

SAAM - special assignment airlift mission

sabkas - marshy salt flats, fed by underground water table

SAC - Strategic Air Command

SAFE - safe areas for evasion

SAM - surface-to-air missile; a surface-launched missile designed to operate against a target above the surface

SAMS - School of Advanced Military Studies [Army]

SANG - Saudi Arabian National Guard

SAS - Special Air Service [UK]

SATCOM - satellite communications

SBU - Small Boat Unit

SBSS - Standard Base Supply System

SCDL - surveillance control data link

SCI - sensitive compartmented information; all information and materials bearing special community controls indicating restricted handling within present and future community intelligence collection programs and their end products for which community systems of compartmentation have been or will be formally established

SDC - shaft-driven compressor

SDV - swimmer delivery vehicle [Navy]

SEA - sea echelon area [Navy]

Seabee - construction engineer [Navy]

SEAD - suppression of enemy air defenses; activity which neutralizes, destroys or temporarily degrades enemy air defenses in a specific area by physical attack and/or electronic warfare

SEAL - sea, air and land; Navy officers and enlisted members specially trained and equipped for unconventional and paramilitary operations including surveillance and reconnaissance in and from restricted waters, rivers and coastal areas. Seals also are able to train allies in special operations [Navy]

SEP - spherical error probable

SERE - survival, evasion, resistance and escape

SEVENTHFLT - 7th Fleet, the Navy command whose area of operations includes the Western Pacific and Indian Oceans

SF - Special Forces

SFG - Special Forces Group

SFOD - Special Forces Operational Detachment

SH - Station Hospital

shamal - sand/wind storm; literally means "north"

SHAPE - Supreme Headquarters, Allied Powers, Europe

SHF - super-high frequency

short ton - 2,000 pounds or 0.907 metric tons

SI - special intelligence

SIA - station of initial assignment [USMC]

SIDS - Secondary Imagery Dissemination System

SIGINT - signals intelligence; a category of intelligence including all communications intelligence, electronic intelligence and telemetry intelligence

SINCGARS - Single-channel Ground and Airborne Radio System

SITREP - situation report; a report giving the situation in the area of a reporting unit or formation

SLAM - standoff land-attack missile

SLAR - side-looking airborne radar; an airborne radar, viewing at right angles to the axis of the vehicle, which produces a presentation of terrain or moving targets

SLAT - strike leader attack training [Navy]

SLEP - Service Life Extension Program

SLGR - small, lightweight ground receiver [GPS]

SMCM - surface mine countermeasures [Navy]

SME - Squadron Medical Element [USAF]

SMESA - Special Middle East Sealift Arrangement [MSC]

SNEP - Saudi Naval Expansion Program

SOAF - Sultanate of Oman Air Force

SOAR - Special Operations Aviation Regiment

SOC - Sector Operations Center [Iraq]

SOCCENT - Special Operations Command, CENTCOM

SOCCT - Special Operations Combat Control Team

SOCEUR - Special Operations Command, Europe

SOCOM - Special Operations Command

SOCRATES - Special Operations Command Research Analysis and Threat Evaluation System; a program for assessing the level of foreign technology

SOF - Special Operations Forces

SOFA - Status of Forces Agreement

SOG - Special Operations Group [USAF]

SOP - Standard (Standing) Operating Procedure; set of instructions covering those features of operations which lend themselves to a definite or standardized procedure without loss of effectiveness; applicable unless ordered otherwise

SOS - Special Operations Squadron [USAF]

SOSB - 1) Special Operations Signal Battalion; 2) Special Operations Support Battalion

SOTA - Signals intelligence operational tasking authority

SOW - Special Operations Wing [USAF]

SPACC - Space Control Center

SPACECOM - Space Command

SPEAR - Special Project Evaluation and Antiwarfare Research [Navy]

SPG - Special Planning Group [SOF]

SPINS - special instructions

SPOD - sea port of debarkation

SPOE - sea port of embarkation

SR - special reconnaissance [SOF]

SRA - Specialized Repair Activity

SRAM - short-range air-to-surface attack missile

SRBM - short-range ballistic missile; ballistic missile with a range of about 600 nautical miles

SRIG - Surveillance, Reconnaissance and Intelligence Group; intelligence command of roughly regimental size that contains reconnaissance, interrogator, counterintelligence, unmanned aerial vehicles, intelligence analysis, signals intelligence, and special communications units.; detachments task organized for assignment to Marine Air-Ground Task Force command elements [USMC]

SRP - Sealift Readiness Program

SSA - Special Support Activity [NSA]

SSCRA - Soldiers and Sailors Civil Relief Act

SSM - surface-to-surface missile; a surface-launched missile designed to operate against a target on the surface

SSN - nuclear-powered attack submarine

SSO - Special Security Office

STANAVFORCHAN - Standing Naval Force, Channel

STAR - scheduled theater airlift route

Stop loss - program designed to retain on active duty service members with skills crucial to an operation

STOVL - short takeoff and vertical landing

STRICOM - Strike Command (1960s)

STU - secure telephone unit

SUCAP - surface combat air patrol

SUPCOM - Support Command

SWA - Southwest Asia

SWAPDOP - Southwest Asia Petroleum Distribution Operational Project

SWIP - Systems Weapon Improvement Program

SYERS - Senior Year Electro-optical Reconnaissance System [USAF]

T

T&E - Test and evaluation

TAA - tactical assembly area

TAC - Tactical Air Command; Air Force organization designed to conduct offensive and defensive air operations in conjunction with land or sea forces

TACAIR - tactical air

TACC - Tactical Air Command Center; principal Marine Corps air operation installation from which aircraft and air warning functions of tactical air operations are directed; it is the senior agency of the Marine Corps Air Command and Control System [USMC]

TACINTEL - tactical intelligence; intelligence required for planning and conduct of tactical operations

TACON - tactical control; detailed and usually local direction and control of movements or maneuvers needed to accomplish missions or tasks assigned

TACP - tactical air control party; subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft operating in close proximity to ground forces

TACSAT - tactical satellite

TACTRAGRU - Tactical Training Group [Navy]

TADMs - TR-1 ASARS Data Manipulation System [UK]

TADS - target acquisition and designation Sight [Army]

TADSIXS-B - Tactical Data Information Exchange System-B

TAF - Tactical Air Force

TAH - hospital ship

TAI - target of interest

takedown - forcible boarding of a ship by helicopter-borne forces, to compel the ship to stop and comply with maritime interception operations

TALD - tactical air-launched decoy

TAMMIS - Theater Army Medical Management and Information System

TAMP - Theater Aviation Maintenance Program

TAOC - Tactical Air Operations Center; subordinate operational component of the Marine Air Command and Control System designed for direction and control of all en route air traffic and air defense operations, to include manned interceptors and surface-to-air weapons, in an assigned sector; under the operational control of the Tactical Air Command Center [USMC]

TAR - training and administration into the Reserve [Navy]

TARPS - Tactical Aerial Reconnaissance Pod System [Navy]

TAACOM - Theater Area Army Command

TASM - Tomahawk antiship missile

TASOSC - Theater Army Special Operations Support Command

TAVB - aviation logistics ship; a Military Sealift Command ship, normally roll-on/roll-off, on which aviation intermediate maintenance facilities and supplies are embarked during Marine amphibious or Maritime Prepositioning Force operations. [Navy, USMC]

TAW - Tactical Airlift Wing [Air Force]

TBM - tactical ballistic missile

TBTC - Transportable Blood Transshipment Center

TCAE - Technical Control and Analysis Element

TDF - tactical digital facsimile

TDRSS - Tracking and Data Relay Satellite System

TDY - temporary duty

TEAM - Tactical EA-6B Mission Support Element

TEL - transporter erector launcher

TENCAP - tactical exploitation of national capabilities

TERCOM - terrain contour matching

TERPES - Tactical Electronic Reconnaissance Processing and Evaluation System

TERS - Tactical Event Reporting System

TF - Task Force; a temporary grouping of units, under one commander, formed to carry out a specific mission or operation

TFS - Tactical Fighter Squadron [USAF]

TFU - Tactical Forecast Unit [USAF]

TFW - Tactical Fighter Wing [USAF]

throughput capacity - rate at which personnel and equipment are received and processed

THMT - tactical high-mobility terminal

TI - total inventory

TIBS - Tactical Information Broadcast System [USAF]

TIS - Thermal Imaging System

TLAM - Tomahawk land-attack missile

TMIS - Theater Medical Information System

TNMCS - total not-mission capable, supply [USAF]

TO&E - Table of Organization and Equipment

TOSS - Tactical Operations Support System

TOT - time on target; time at which aircraft are scheduled to attack/photograph the target

TPFDD - time-phased force and deployment data

TPFDL - time-phased force and deployment list

TPU - Troop Program Unit

TPW - target planning worksheet

TRAC - tactical radar correlator [Army]

TRADOC - Training and Doctrine Command [Army]

TRAM - tractor, rubber-tired, articulated, multipurpose

TRANSCOM - Transportation Command

TRAP - tactical receive equipment and related applications

TRI-TAC - Joint Tactical Communications Program

TSS - Tactical Shelter System

TTAD - temporary tour of active duty

TTU - Transportation Terminal Unit; designed to conduct port operations [Army]

TWV - tactical wheeled vehicle

U

UAE - United Arab Emirates

UAEAF - United Arab Emirates Air Force

UAV - unmanned aerial vehicle

UHF - ultra-high frequency

UIC - unit identification code; a six-character, alphanumeric code that uniquely identifies each Active, Reserve and National Guard unit of the Armed Forces

UK - United Kingdom

ULCS - unit-level circuit switch

UMMIPS - Uniform Material Movement and Issue Priority System

UN - United Nations

UNAAF - Unified Action Armed Forces; publication setting forth the principle, doctrines, and functions governing the activities and performance of the Armed Forces of the United States when two or more Services or elements thereof are acting together

UNSC - United Nations Security Council

USAF - United States Air Force

USAFE - US Air Forces, Europe
USAMMCE - US Army Medical Materiel Center - Europe
USAMMCSA - US Army Medical Materiel Center - Saudi Arabia
USAR - US Army Reserve
USAREUR - US Army, Europe
USASG - US Army Support Group
USCG -United States Coast Guard
USDAO - US Defense Attache Office
USIA - US Information Agency
USMC - United States Marine Corps
USMCMG - US Mine Counter Measures Group
USMCR - United States Marine Corps Reserve
USMTM - United States Military Training Mission
USNR - United States Naval Reserve
USO - United Service Organizations
USSR - Union of Soviet Socialist Republics
UW - unconventional warfare; broad spectrum of military and paramilitary operations conducted in enemy-held, enemy-controlled or politically sensitive territory

V

VA - Department of Veterans Affairs
VCJCS - Vice Chairman, Joint Chiefs of Staff
VHF - very-high frequency
VLS - Vertical Launch System
VS-17 - fluorescent orange panel

W

WATCHCON - watch condition

WEU - West European Union

WMP - War and Mobilization Plan [USAF]

WRM - war reserve materiel

WRSK - War Readiness Spares Kit [USAF]

WSEP - Weapons System Evaluation Program

WSIP II - Weapons System Improvement Program

WWIMS - Worldwide Indicators and Monitoring System

WWMCCS - Worldwide Military Command and Control System

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